AMERICAN AGRICULTURIST

FOR THE

FARM · GARDEN · & · HOUSEHOLD

"AGRICULTURE IS THE MOST HEALTHFUL, MOST USEFUL, AND MOST NOBLE EMPLOYMENT OF MAN."—WASHINGTON.

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GEMS OF THE FLOWER GARDEN.

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BEAUTIFUL FLOWERS AND PLENTY OF THEM.

C. L. ALLEN.

O have beautiful flowers and plenty of them, requires neither professional skill nor a great outlay of money, if judiciously invested. For the open border, the ornamental garden annuals are the most interesting flowers and the easiness of their culture makes them particularly valuable for general display. It is astonishing how much beauty there may be had in a little garden, only a few yards in extent, by a tasteful arrangement of annual flowers. All that is required is a knowledge of the colors, forms and habits of growth of the different kinds. Many of the common annuals we meet in the garden are not worth growing, but they are allowed to remain year after year simply because their cultivators have them and do not know of any that are better, and the many beautiful annuals introduced by our seedsmen are not pushed as vigorously as are bedding plants, bulbs or roses. There is not a farmer worthy the name but knows that the value of his farm would be enhanced if made more attractive by a well-ordered flower garden; at the same time necessity has made economy his watchword, so that what is generally considered needless expense cannot be tolerated. Yet a dollar, wisely invested in flower seeds, will buy at least one hundred plants each of the following:

SINGLE DAHLIAS.—The raising of dahlias from seed is one of the pleasures of gardening, and it is difficult to understand why the practice is not more common since it is attended with so little trouble in proportion to the success attained. Seed sown in a hot-bed, or in pans in the house, will make good flowering plants by the middle of July; in fact, they come into flower nearly as soon as when the roots are planted out in May. The plants should be set in rows three feet apart, and a foot apart in the rows, so that if one-half of the plants produce flowers that are not desirable, they may be thrown out, and the remainder will amply cover the ground. A great cause of failure in planting dahlias, as with most other flowers, comes from planting too closely. Plants must have room for their perfect development. This rule is generally disregarded, and as many as twenty plants are allowed to occupy the space that is but sufficient for one.

In growing single dahlias, a few of the most beautiful ones should be saved for seed, and be grown separate from the others. To insure good seed, some growers consider it absolutely necessary to cross-fertilize; yet experience teaches that seed saved from good flowers is quite as apt to produce good results without cross-fertilization as with it. Certain it is, however, that seed from poor or medium flowers should never be saved, and that but few flowers on a plant should be allowed to perfect seed. These should be well defined as to form, color or markings, and in order to keep the plants true to the single form, the seed should be saved early in August. When the nights begin to get cool, the flowers are more likely to assume the double form; the disks elongate in order to protect the infant plant, which they will not do in hot weather. It is impossible to keep the double form in hot climates, and it is nearly as difficult to retain the single forms in cool climates. For garden display, always grow the single dahlias from seed.

ZINNIAS.—Next in order to the single dahlia for garden display is the new type of dwarf double zinnias. They are as easily grown from seeds as the common weeds that come into flower in July. It is best to sow the seed where the plants are to remain. Mark out the rows thirty inches apart, put two or three seeds in a hill, making the hills a foot apart in the rows. As soon as the plants show their second leaves, thin out to one plant in a place, and always select the weakest, as it is sure to produce the most double flowers. Should any single forms appear, throw them out, as the plants should stand at least thirty inches apart for perfect development. In fact, if the soil is deep and rich, the plants will cover the ground, when set three feet apart each way.

PANSIES.—For early spring flowers sow the seed in August, and protect the young plants during winter by a covering of newly-fallen leaves. In northern climates it is better to put a frame over them, after a light covering of leaves has been given, and to protect with a shutter or sash. For summer flowers, sow the seed as soon as the ground can be worked in spring. As our summer's sun is so severe on this flower, the pansy bed should be covered with a lattice frame, the slats placed so as to exclude two-thirds of the sun's rays. In moist, heavy soil, pansies can be had the entire summer. For autumn flowers, sow the seed in August, in any unoccupied ground, and let the plants remain where they appear, only keep them well cultivated, and the garden will be interesting after the frost has killed the more tender flowers.

CALENDULAS.—The famous old Cape Marigolds are among the plants that need no praise; they speak of their own beauty and usefulness, in November, when nearly all other flowers have perished. They commence to flower in July and increase in beauty with the weeks. There are no other flowers as useful in autumn, none so freely produced. The plants should be allowed plenty of room. If planted a foot apart each way, they will fill the entire space, and produce a mass of bloom the whole season. The double flowering varieties are best.

TAGETES.—(Marigolds). Both the French and African kinds should be grown in every garden, if but a single plant of each. The former are very free flowering and positive in their stripes and markings. The latter are all selfs, of various shades of yellow and orange, and are wonderfully floriferous.

MIGNONETTE.—This universal favorite succeeds best in a heavy, moist soil, made very rich. To have it in perfection the plants should not be closer than six inches each way, and the top bud should be pinched off when the plant is two inches high. When this is done, the plants will be robust and produce sturdy spikes of flowers all through the summer and autumn. The "Machet" is decidedly the best, although the Golden Queen has many admirers.

BALSAMS.—Just as beautiful as when they were popular fifty years ago, balsams are but rarely grown in perfection. Give the plants plenty of room, two and a half feet each way, and a rich soil, and the result will be astounding. Plants three feet high and as much in diameter can be easily grown and made to furnish a wealth of bloom that is difficult to excel.

ASTERS.—To appear to best advantage asters should be grown in quantity and so that they are at their best in autumn. They are not a midsummer flower in our climate; the hot sun blights, and the black beetle destroys the flowers in July and August. But sow the seed about the first of July in rows two feet apart, thin out the plants to six inches apart in the rows, cultivate well, and a grand display of flowers will appear in September and October, as the aster will endure a few degrees of frost without injury.

GAILLARDIA.—The new type of this good old annual, *G. picta Lorenziana*, has about as many virtues and as few faults as any plant known. It will grow anywhere, under almost any conditions, and yet flower profusely. The flowers are of various colors, many of them of neutral tints, but decidedly beautiful. For vases of cut flowers, in autumn, the Gaillardias are among the best, graceful, pleasing and lasting. These plants must have room—two feet apart each way is barely enough—with that there will be a continuous mass of flowers. Although there is a wide range of color, there is always harmony. The colors can be easily kept separate, but quite as good effect is produced when mixed seed is sown.

SALVIA SPLENDENS.—The scarlet sage, although not an annual, but grown for years as a pot plant, may be had in perfection when grown as such. The seeds should be sown in the greenhouse or hotbed in early spring. Then the plants will be rich in bloom in August and continue so until frost.

NASTURTIUMS.—The dwarf varieties of nasturtium are among the most valuable annuals, as they furnish a never-failing supply of brilliant flowers and foliage for the garden, as well as for the home. A special point in their favor is that they thrive admirably in poorer soil than would be congenial to most other flowering plants.

MARVEL OF PERU.—For a striking effect in a large border this plant is invaluable, old-fashioned though it may be called by some persons. To fully develop their beauty, the plants must be thinned out to at least one foot apart.

Sweet peas, annual phlox and scores of other sorts equally meritorious, might be added to the list. There are, also, many hardy herbaceous perennials that flower the first year from seed that should be grown for the sake of their flowers which appear in May and early June, before the annuals bloom. Among the number are the Delphinums that produce their flowers early, and the plants from seed sown in the spring will also flower the same season, thus keeping up a succession of bloom. [Single dahlias, pansies, asters, balsams, and mignonette are vividly portrayed in our frontispiece engraving.]

RAISE MORE BEANS AND PEAS.

While we have an overproduction of many agricultural products, this is not the case with regard to beans and peas, our imports largely exceeding our exports. The following table covers a period of five years, ending June 30, 1891, and has been specially prepared for the AMERICAN AGRICULTURIST. It shows, at a glance, the value of our imports of peas and beans, our exports and the excess of imports over exports yearly. It also gives separately the average value per bushel of each year's exports and imports:

	Imports.	*Exports.*	*Net Imports.*	*Value per Bu. Imp.*	*Value per Bu. Exp.*
1891	$1,656,768	$251,063	$1,405,705	$1.25	$1.88
1890	1,250,287	261,212	989,075	1.04	2.14
1889	765,483	294,456	471,027	1.03	1.90
1888	1,942,864	253,170	1,689,694	1.13	1.83
1887	648,388	387,222	261,166	.92	1.45

These figures show that our imports of peas and beans have been gradually growing larger. In 1887, they were only a little more than $250,000 in excess of our exports, whereas for the last fiscal year they were almost $1,500,000 in excess. While the exports have been gradually decreasing in value, the imports have been increasing in a much larger ratio, thus swelling the value of the net imports.

While the value of the beans and peas imported shows a gradual increase per bushel, there have been more fluctuations in the value of the domestic products which we have been exporting, and the price of our own beans and peas was from sixty to one hundred per cent. higher than what we imported. If our own beans are worth so much more in the market than foreign beans, there should surely be sufficient inducement for farmers to increase their crops of this staple article of food. The duty has, under the McKinley bill, been increased from ten to twenty-five per cent. on beans, being now forty cents per bushel, and thirty per cent. on peas. Notwithstanding this fact, the imports for the last year at the higher rate of duty were greater by $500,000 than when the duty was lower, and at the same time the price paid per bushel was higher than it had been previously. The higher the price and the higher the duty, the more beans and peas we imported. Surely, under such circumstances, it will pay our farmers to increase these crops. As a matter of fact, last year we paid a net total of $1,600,000 for foreign beans and peas, most of which might and should have been grown in our own country. Much of this money went to Canada, but the following table shows where and in what proportion the principal foreign countries participated in the benefits derived from shortsightedness on our part:

	Bushels.			
Imported From	1887.	1888.	1889.	1890.
Canada	597,697	533,191	647,300	624,799
France	18,802	648,720	26,548	87,614
Germany	6,746	43,830	13,235	127,063
Mexico	67,40	21,506	42,785	47,254
Argentine		252,018		
French possessions		186,764		
Italy		135,785	8,319	107,682
Austria Hungary		106,351	11,380	182,725
Belgium	8,549			46,281
Cuba			6,961	5,827
Netherlands				12,192

PACKING AND MARKETING VEGETABLES.

J. H. HALE, CONNECTICUT.

In the preparation of vegetables for market, there has been a very marked improvement in recent years. Formerly nearly all vegetables were carried to market unwashed, in old sacks, dirty barrels, or in bulk in a rough farm wagon. Now, the man who succeeds, if he is doing much of any business, has a packing house to which all vegetables are brought direct from the fields; here they are assorted, graded, measured, counted, trimmed, bunched and washed as occasion or the variety may require. They are put up in the most approved manner possible and loaded on wagons so as to make an attractive display. The market gardener has learned—what the average farmer apparently has not—that to sell his products to the best advantage, he must first please the eye of his customers.

I have seen asparagus, green and crisp, sent to market in old, rough boxes, tied with rough twine or bass bark, sell at six cents per pound, while another lot, of no better quality, sold in the same market for ten cents. This advanced price came wholly from the appearance of the "grass," each bunch being neatly tied with narrow pink cotton tape and then packed in new, clean white boxes, giving the whole stock a tempting, appetizing appearance, resulting in an advance of sixty-six and two-thirds per cent.

Celery not thoroughly cleaned and roughly bunched, as of old, can now only be sold at very low rates. To bring good prices it must be thoroughly cleaned, neatly bunched and tied with clean twine of some sort. Sometimes it is seen tied with blue cotton tape; this in contrast with the cleanly bleached stems makes a very fine show on the market, and causes more ready sale, if not higher prices. However, I have known it to cause an advance of twenty-five per cent. in the price of the product. Some may suppose that these little bits of style do not add one whit to the real value of the vegetables, yet the fact remains that they do add to the selling value, and therefore the most progressive market gardeners are constantly on the alert for new ideas as to packing and marketing.

GROWTH OF THE GRAIN TRADE.

J. L. SCHRADER, N. Y.

When the Western country was sparsely settled, the movement of grain was westward in the shape of flour, instead of from the West as now. Small lots of wheat, from Cleveland and Sandusky were carried to Buffalo on sailing vessels carrying from 2,000 to 3,000 bushels. The milling center was at Rochester, the flour was brought back to Buffalo by canal, and shipped by vessel to St. Joseph. The flour was known as "Genesee," a brand famous in its day. All the little mills the country round labeled their make, no matter what the quality, "Genesee." In 1833 the first wheat was shipped from Chicago in lots from 500 to 1,000 bushels, in bags, and the freight charge was twenty-five cents a bag, or about sixteen cents a bushel. The first full cargo, 2,800 bushels in bulk, was shipped, in 1834, to Buffalo at fourteen cents a bushel freight. From 1840 to 1850 the cargoes ran from 3,000 bushels to 7,000 bushels, and occasionally as high as 10,000 bushels, and the freights were from eight cents to fifteen cents per bushel. As late as 1861 thirty cents a bushel was paid on wheat from Chicago to Buffalo. That was said to be the highest figure ever paid for lake transportation, but during the civil war and after its close freights were quite high.

Now almost the entire business is done by steamboats, costing from $100,000 to $250,000 each, and carrying from 75,000 bushels to 125,000 bushels of grain at a cost for freight of two cents per bushel and, by carrying coal cargoes back, making a fair profit. Wheat was shipped from Chicago to Buffalo, nine hundred miles, the past season, at one cent per bushel freight, and out of this the steamer had to pay one-half cent for trimming at Chicago and shoveling at Buffalo. From Duluth wheat was carried to Buffalo for one and one-quarter cents. Such figures, however, prevail only when the freight movement is very light and many vessels are offered. The freight from Chicago to Buffalo, last season, ranged from one cent to four and three-quarter cents per bushel with an average of about two and a half cents. The Duluth average was a little higher. No wheat was shipped from Lake Superior until 1870, but, during the season of 1891, 38,800,000 bushels were moved from Duluth, Superior and Fort William. The Sault canal and lock have been of incalculable benefit to the shipping interests, and, therefore, to the producers of grain. Further enlargement will bring further benefits.

The Erie canal was opened in 1825 with great ceremony. Until 1845, when the first railroad from the East reached Buffalo, all receipts and shipments were by canal. Wheat freights were as high as twenty-five cents a bushel in 1845, when the first shipments were made; this including a toll of six and a quarter cents. In 1847 forty-seven cents was paid on wheat to Troy, including the toll. Boats did not pass down the Hudson river until after 1850, transfer to barges being made at Troy. These high freight rates left little money for the grain grower. Tolls were gradually reduced until they were one cent per bushel for wheat, and in 1882 they were abolished altogether. In 1877 the average rate on wheat by canal from Buffalo to New York was seven and one-half cents, in 1890 three and three-quarter cents, and during the season of 1891 the rate was three and one-half cents. Deepen the canal so that boats can go down drawing seven feet, and wheat can be carried profitably for less than three cents a bushel. This improvement must soon come.

As has been intimated, the railroads running eastward from Buffalo took more grain last fall than ever before. They contracted it as low as five cents a bushel to New York, including the terminal charge of seven-eighths of one cent. Their ordinary rate from Buffalo to New York is 7.8 cents. The Erie canal has brought rail rates down to a reasonable basis, and has acted as a regulator of such charges. It would be a sad day for the agricultural and mercantile interests of the entire Western country should the Erie canal be abandoned, and the railroads be permitted to exact extortionate rates. The Erie canal must be maintained and improved.

VILLAGE IMPROVEMENT AND TREE-PLANTING.

B. G. NORTHROP.

The homes of the American people to-day are in happy contrast with those of fifty years ago in their architecture and surroundings. Of the many agencies tending to this result, none has done more than the hundreds of village improvement societies now scattered widely over the country. Their influence has not been limited to the towns, counties or States where they have been organized, for the discussions they have prompted, and the plans and ideas thus advocated by the press of the country, have benefited and brightened thousands of homes. The recent advocacy of village improvement by leading journals has given a strong impulse to this movement, so that more of these societies have been organized during the last year than in any previous ten years. It is an index of its value that practical and unsentimental railroad corporations now facilitate this work because it tends to improve and build up towns on their lines. The AMERICAN AGRICULTURIST was the first of the farmers' papers in this country to earnestly encourage village improvement, and from the beginning of the movement it strenuously urged the formation of such a society in every town in the country.

Though much has been accomplished—far more than I ever expected to witness when enlisting in this service, over twenty years ago—yet, compared with the public needs and the rich opportunities now opening on every hand, this work seems just begun. The most progressive and public-spirited communities are the very ones that are specially appreciative of organized efforts for the general good. Our best towns, without an improvement society, often fall far short of what they might be and ought to be, for in them, here and there, are found neglected private grounds, dilapidated dwellings, barns and sheds, or a street fronting the house ugly with piles of decaying brush, or chips, old cans, harrows, carts or sleds, a fence with missing pickets, or a disabled gate which gives an air of shiftlessness sadly marring the effect of an otherwise beautiful village.

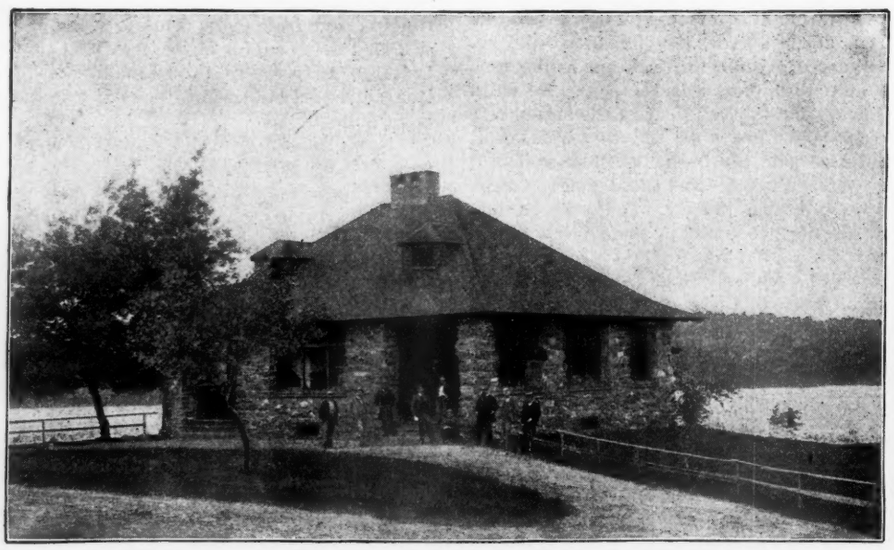


Fig. 1. THE LODGE.

When an improvement society once develops private taste and public spirit, such defacements disappear. Where every citizen is thus stimulated to make his own wayside free from rubbish, and then neat and attractive, the entire town becomes so inviting as to give new value and attractions to all its homes. It is high praise to any people that they fondly cherish their homes. A stranger can hardly drive through such a town without saying, "Here are people of refinement, who tastefully guard the surroundings of their daily life." These surroundings, trifling as they seem, may be constant factors in forming character. Clearing up, dusting and putting things in order are little matters in parlor or sitting-room, yet how soon would each become forbidding were these trifles neglected. Just so in a village; let minor matters be neglected or slighted, and the comfort, content, reputation and prosperity of a whole community suffers. But, worst of all, home life suffers, and character deteriorates. Modern civilization relates to the homes and social life of the people, to their health, comfort, thrift, and their intellectual, social and moral advancement. In earlier ages, men were counted in the aggregate, and valued as they helped to swell the revenues or retinues of kings. The government was the unit, and each individual only added one to the roll of soldiers or serfs. Happily for us the family is the unit of the State, and government is for the people, as well as by the people. This gives to the concrete all the characteristics that make the home beautiful and attractive. Thus, love of home is primary patriotism.

When recently surveying a town, in order to adapt my lecture to local needs, as we passed a large house and spacious barns, with all the surroundings neglected and forbidding, my escort said: "Here lives the richest and meanest man of our town. Twenty years ago he brought here a refined young lady as a bride. For a few years it was her ambition and delight to adorn her new home without and within. At length her strong, innate love of the beautiful was cruelly crushed, for this thoughtless, if not heartless, wretch 'would no longer permit such waste of her time on good-for-nothing posies.' Driven to despair, she has been for years in the asylum among the incurably insane."

This may not be a typical case, but it contains a warning of wide application. While the pursuits of farmers, under right conditions, are highly favorable to health and longevity, too often they, and still more their wives, seem specially liable to depression and insanity. The farmer's home should be social and sunny. However humble, it may be tasteful and attractive. The isolation of the farmer's dwelling should suggest the wisdom and necessity of providing home enjoyments and fostering home courtesies. As flowers seem worthless only to the senseless, so the morning and evening salutations in the family may seem little in themselves, but, when fitly observed, they are constant forces, and therefore mighty in their influence. As the sunbeam is composed of many minute rays, so every farmer's home should be illumined and brightened by Nature's richest hues without, and, still more, within, by all the sweet amenities of life. These amenities and affections may be, and should be, the sunshine of every home. They refresh and purify the social circle. Like the clinging vine, they twine themselves around the heart, calling forth its strongest affections, and securing its happiest and most healthful activity. Such affections dignify homely drudgery, make tough toils pleasant, painful sacrifices easy, and perils and privations cheerfully endured. Under the inspiration of such affections, there is often a genuine heroism in the home, unsurpassed, if not unequaled, by any which the world lauds on the battlefield.

The isolation of the farmer's home does not warrant gloom of mind or dreary surroundings. His home should be one of intelligence. Farming need not be a plodding routine life. A first-class agricultural paper is a good investment, that he may know the best agricultural processes and products, improvements and stock. For his own sake and that of his family, current events at home and abroad should be familiarly discussed. Brain and muscle need to work together, for the highest health of each. The dull and stupid are short-lived. The farmer works most cheerfully when the mental horizon is broadened, so that he looks far beyond the sphere of his daily work. How many homes, even on the Western frontier, have been the abodes of intelligence, courage, industry, contentment and good cheer, where early hardships have developed noble characters that made the desert rejoice and blossom as the rose.

When in Nebraska city, the guest of an ex-governor of Nebraska I found a happy contrast to the miser's wretched home. To this State, then a Territory, just ceded by the Indians to the United States, and still a wilderness, he brought his bride, a cultivated lady from Detroit, who cheerfully made the best of their log hut. Soon flowers, shrubs and vines sprang up on every side, until at length a veritable Eden, largely planted and tilled by her hands, surrounded that humble home, and in a few years a stately mansion, beautiful within as well as without, rose in its place. How much did her love of the beautiful and her purpose to create this paradise on which her heart was set when she first saw this spot, and saw, too, its possibilities, lighten the burdens and lessen the privations of a

pioneer life. Bright visions of a beautiful home were an inspiration and a benediction to that happy household years before they were fully realized.

It seems fitting that such a home fitly named Arbor "Lodge," should be the birthplace of Arbor Day. It was a happy idea to designate a given day when all should unite in the work of planting trees. This honor belongs to Ex-Governor J. Sterling Morton, of Nebraska. The first proclamation for the observance of such a day was made at his suggestion by Governor Furnas, of Nebraska, and it is said twelve millions of trees were planted on the day thus designated. It was soon established by law as a legal holiday, and provision was made for awarding premiums to those who set out the most trees in its observance. The prizes offered for tree-planting secured definite statistics from official county returns, annually made December 31st. At the American Forestry Association held in Boston, September, 1885, Ex-Governor Morton said: "Arbor Day has worked well in Nebraska, and we have growing in that State, to-day, more than 700,000 acres of trees which have been planted by human hands." The rapidity of growth of the forests first planted, not only cottonwood but more valuable timber trees, and especially the favorite black walnut, was a grateful surprise. It demonstrated the value of these trees for fuel, fences and lumber (the special need of treeless prairies), so that a great impulse has recently been given to this work. The latest figures are so enormous as to seem incredible to those who have not witnessed the interest, not to say enthusiasm of Nebraskans, in this work. So broad and beneficent have been the results of the Arbor Day movement in Nebraska, that its originator is there gratefully recognized as a benefactor of the State, now the leading State of America for tree-planting. It glories in the old misnomer, "The Great American Desert," since it has become so habitable and hospitable by cultivation and tree-planting. Where twenty years ago the school geographies said trees would not grow, the settler who does not now plan for tree-planting is the exception. The Nebraskans are justly proud of this great achievement and are determined to maintain their preëminence. In this grand work Arbor Day in schools was not then thought of, economic tree-planting being the great aim. Less than ten years ago, at the American Forestry Association in session at St. Paul, I offered a resolution in favor of observing Arbor Day in schools in all our States and in the provinces of the Dominion of Canada (the association being international) which was adopted, and a committee appointed to push that work. Now, Arbor Day is observed in thirty-nine States and Territories by legislative act or by special recommendation of the governor or school superintendent, and in some States by the State grange and State agricultural societies. It has already become the most interesting, widely observed and useful of school holidays. It should not be a legal holiday. That was, no doubt, a wise provision for the once treeless plains and prairies of Nebraska. The attempt to make it a legal holiday elsewhere, starts needless objections, which have defeated such a bill in a few instances.

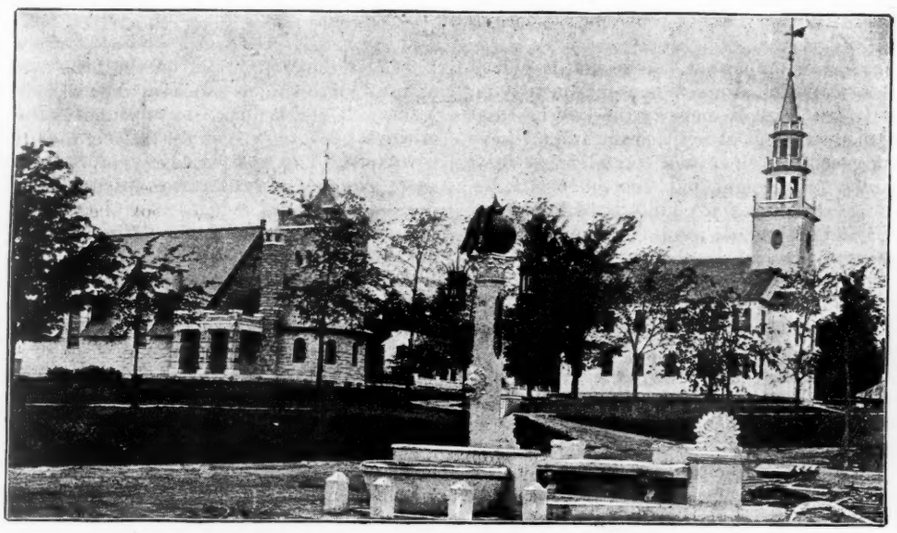


Fig. 2. MEMORIAL CHAPEL AND FOUNTAIN.

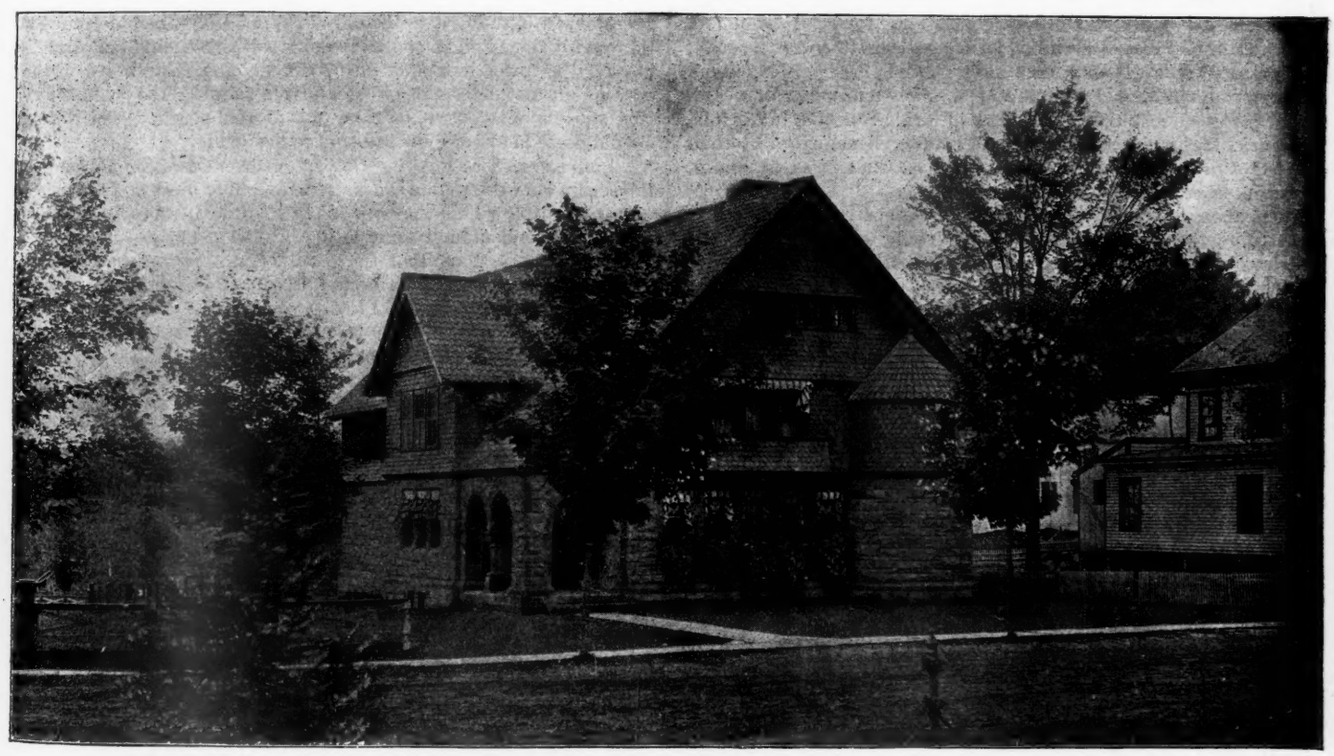


Fig. 3. THE NORFOLK LIBRARY.

Arbor Day has become a patriotic observance in those Southern States which have fixed its date on Washington's birthday. The

custom of planting memorial trees in honor of Washington, Lincoln, Grant and other patriots or authors, is now general. What growth of mind and heart may come to youth who plant and care for trees as monuments of history and character? Says Governor Morton: "All other anniversaries refer to the past and its dead. Arbor Day, alone, deals with the present and the future. It stretches its sheltering shades over the unborn millions of coming generations, and in the voices of the leafy woods pronounces benedictions upon posterity."

Arbor Day has become an important coefficient in village improvement. It has led to the planting of thousands of trees on the limited school grounds, but myriads more by the waysides and around the homes. As there remains little space for trees, I have recommended the planting of some vines, and specially that most beautiful one, the Japanese Ivy, around both the school and the home. The Arbor Day festival may help to counteract the tendency of the farmer's life to isolation and seclusion, promoting neighborly feeling and strengthening social ties and teaching the art of turning work into play. It is wise to multiply such occasions for social enjoyment.

The laborers of France and Germany socialize far more than American farmers. The festive spirit is a marked feature of their character. It is manifested in the family, for young and old, rich or poor, all take their outings together—in neighborhood meetings, in processions and various social gatherings. Whole families seem to enjoy everything together as they visit the beautiful gardens and woods which abound in or near their cities and towns. In Germany, this genial spirit is everywhere fostered by music, vocal or instrumental. As every one sings, a concert may be easily extemporized at every such picnic. As a result, there is an inexpressible something in the German character that carries mirthful and happy childhood into old age, giving an added charm to social life, and lightness and cheer to sober work.

Village improvement is often carried on by individual, as well as by organized efforts, where a citizen or a family of liberal views and large means become benefactors of their native town, and thus by example and personal influence awaken town pride and public spirit. Norfolk, Conn., furnishes a striking illustration of this kind. Twenty years ago it was a declining town. Now it is a favorite summer resort, proud of its recent growth and prosperity, and grateful to the family that have caused this transformation. Such an example should prompt others. How many men of wealth in our favored age, like the Battell and Eldridge families in Norfolk, are enriching their own lives in becoming benefactors of their native towns by gifts for libraries, schools, cemeteries, fountains, parks or other institutions or improvements. It is a privilege to witness their happiness in seeing the fruits of such beneficence. What a contrast such noble characters show to the grasping and avaricious niggard—unhappy and unloved in life and unmourned in death.

[The Fountain, Chapel, Library and Lodge, provided by private munificence, with their charming grounds, as seen in the engravings, are not surpassed in any town of its size in this country. The Norfolk Library, a costly stone structure, ample for 40,000 volumes, with 5,000 already, and funds for large additions, the Memorial Chapel, also of stone, the Robbins School, and many other gifts, will prove lasting monuments of the generous donors. The picturesque Lodge, on Lake Waugum, built of stone taken from its borders, is at the terminus of a romantic mountain drive, four miles from the village, a favorite resort, greatly enjoyed by the townspeople and their guests. A perspective view of it is presented in Fig. 1, the Memorial Chapel and Fountain are seen in Fig. 2, and the Norfolk Library in Fig. 3.]

Which is the Better?—The cattle must be kept warm in winter if they are to be kept alive, and, to keep them profitably, they need more than the preservation of life. Health requires that they be comfortable. The storms can be kept out in part by heavy feeding. We all know that a full, hearty dinner goes far toward making the afternoon comfortable, when it would otherwise be cold and possibly sickening. The question of whether it is better to rely upon heavy rations to carry the cattle through, or supply shelter and lighten the food, has been settled, so far as the pecuniary profit is concerned. Extensive experiments, extending over several years, decide uniformly that it pays better to put a shelter over the animal than attempt to keep its spirits up by high feeding. The only point now is to overcome the inertia of lazy shiftlessness that is not moved by the great humane element that enters into the problem. Stand not and see your shivering cow suffer from exposure, when it means dollars out of your pocket. Even if the balance sheet is equal, build the shed and begin a life of kindness to the dumb brutes, which, after all, are among our best friends. It is better to be merciful to the kine.

CABBAGE CULTURE WITHOUT TRANSPLANTING.

JOHN C. UMSTED, KANSAS.

Of all the crops raised on the farm none depends so much on naturally rich land as cabbage. The best soil is a deep, black, loose loam, well drained, such as is found in the valleys of the smaller streams. It is plowed in the fall, eight or ten inches deep, in narrow lands. The first ten days of April is our time for sowing the seed. The ground is harrowed only to level it, as the action of frost during winter has reduced it to the fineness of ashes. It is then marked off three feet each way with a corn marker. With a hoe enough soil is drawn up at each crossmark to make a small, flat hill, a little above the general level. A dozen seeds are dropped on each and pressed down by the foot to bring the seed in close contact with the soil, no covering being necessary. A day or two before the plants appear above ground we pass twice through the rows with a small tooth-cultivator as close as possible without throwing any soil on the hills. This can be easily done as the tracks of the marker serve as a guide.

The second cultivation is given when the plants are an inch high, and should be crosswise of the first plowing, once in a row. The field should be thoroughly cleaned of weeds by the time the plants are two inches high. Discretion must be exercised in thinning the plants. If cut-worms are numerous the hills should not be thinned to one in a place until the plants are four or five inches high, but at no time should they be allowed to crowd one another in the hill. Some hills will be wholly missing. These should be reset from the thinnings, selecting the stockiest plants that come up with good roots. The oftener cabbage is cultivated the better will be the crop. The ground should be kept loose and mellow to a depth of four or five inches. Twenty times is not too often to cultivate cabbage for the best results. Two or three hoeings, only, are necessary, and the first is the only one that will take much time if thoroughly done and the cultivator is used as it should be. Breaking off the lower leaves is no detriment, and their being in the way should not deter the plowman from running the shallow-cutting shovels of a horse-hoe close up to the plants. Cultivation should cease before the heads begin to get solid.

I am aware that but few cabbage growers recommend to sow the seed where the plants are to remain. But most of the writers on cabbage live where the crop is not so often affected by hot, dry weather in midsummer as it is here. The cabbage plant has a long tap root, so long that the plant cannot be removed without breaking it, and when once broken it will never penetrate the soil so deeply as before. In 1885 I had two and a half acres of Late Flat Dutch cabbage, grown without transplanting, that yielded 16,000 marketable heads. Another acre of just as good land was planted with the best plants thinned out on the large field. The returns from this acre were not over six hundred good heads, and the results have been with more or less variation, the same through succeeding years. Of course this plan is advisable for late cabbage only, as the early kinds are transplanted, and have usually headed before dry weather commences.

Lawn and Forest Tree Fungi.—Several kinds of shade trees have been badly blighted during the past year. Among these in the towns and cities, perhaps none have suffered more than the horse-chestnut. By midsummer many of the finest specimens of this ornamental tree have exhibited foliage that appeared as if scorched by a fire. This is due to a leaf-spot fungus *Phyllostreta sphaeropsoides*, etc., that attacks the young foliage and destroys it. Experiments have been made with the carbonate of copper mixture, and noticeably good results have been obtained. With a good hand force pump and a small hose fastened to a long fish pole, large trees can be sprayed with rapidity and ease upon a still day. Complaints have been made of the soft maple exhibiting many black patches upon the leaves. This is due to a fungus, *Rhytesma acerinum* (Pers) Fr. which, growing upon the leaves develops the coal black spots that have a luster of a polished shoe. There are several species of fungi that pray upon the maples. One of them is an anthracnose, and causes the affected leaves to turn brown, curl, and become worthless. There is also a mildew frequently quite injurious to young maples during their first year's growth from the seed.

THE SWEET PEA.

W. T. HUTCHINS, CONNECTICUT.

Since the Sweet Pea was brought from its native Sicily home, where nature gave it the pink and white beauty of what is now called the Painted Lady, the florist's art has developed it into other colors, such as blue, scarlet, purple, brown, etc. Now in the hands of a specialist like Eckford, of Kent, England, it seems to have unlimited promise in color and markings, as well as in form and size. Its praises have never adequately been sung, but its present rapid advancement into popular favor shows that its day has come. For grace of form, variety of colors and markings, fragrance, long, woody stems and unstinted invitation to "cut and come again," it can challenge any rival. It also scores other popular points, such as freedom from insect pests, and long period of flowering. Any lady will find its supposed difficulties of culture easily overcome, and now is a good time to fall in love with Sweet Peas. Besides the brilliant scarlet and all shades of red and pink and flesh color, the improved blues are very fine, and the dark shades of purple, brown, maroon and indigo blue are magnificent. Then the Orange Prince has a standard well worthy the name, and yellow is apparently near at hand, as a new color to work from. The writer has never seen a yellow Sweet Pea, but he has seen enough of an indication of it to work toward it and believe it possible. Culture, also, is working wonders in the form, size, and number of blossoms on a stem. Besides the thirty or more varieties of the old form of Sweet Pea, there is now a fine list of new varieties, larger in size, and having a new form of standard. It is the shape of a palm-leaf fan, and is hooded and wavy. The catalogues contain about fifty named varieties of Sweet Peas, and new ones are gradually introduced. Mention ought to be made of the Lord Anson Blue, which, though not a Sweet Pea, has a decided value in a mixed show. The red and white perennial peas are also fine. As to the culture of this new, old flower, six simple rules must be observed, in addition to the ordinary requirements of successful gardening. The special rules are: (1), Early planting; (2), deep planting; (3), extra fertilizing; (4), strong bushing; (5), watering; (6), free picking. Early planting means just as soon as the ground can be worked, without regard to frosts—as early as the earliest garden peas. In the South, the fall is probably the best time to sow them. They need to make their root growth in the cool, moist, spring ground. Deep planting is to guard against midsummer drouth. But here is a difficulty. They should be planted from four to six inches deep. Sow in a trench or furrow at right depth, but cover at first with only one inch of soil. After they are up bring the earth up to them till it is leveled off at right depth. Sow them in a double row about ten inches apart, and drop the seeds from one to two inches apart in the furrow. As to special fertilizing, scatter wood ashes on freely in the winter time to make strong vines and woody stems. Just before bushing, hoe in some bone flour or phosphate of lime. Nitrate of soda, a handful for every four feet, worked in after the vines are well up, will push them along for early flowering. Then there must be a strong support for a thrifty mass of vines six feet high, with rain and wind coming now and then. Good birch tops are the best; or their equivalent in a strong trellis, with wires not more than six or eight inches apart. Poultry wire, well stretched, is a passable substitute. Look out for dry weather, and pour the water on by the pailful, if

FIG. 2. SWEET PEA, FORM OF INDIGO KING.

FIG. 1. COMMON FORM OF SWEET-PEA FLOWERS.

FIG. 3. SWEET PEA, FORM OF SENATOR.

needed. They love a moist climate. Pick the blossoms freely, and sacrifice the pods. Blossoms from June till October are possible if the pods are kept off and the tops cut back two or three times. Buy reliable, fresh seed and be patient if success is only moderate the first year. [Typical forms of flowers are shown in our engravings.]

COMPETITION IN MARKET GARDENING.

Since the establishment of extensive truck farms in the South from which steamer and train loads of vegetables have been pouring into our Northern cities from March to July of each year, and since the great celery fields of Michigan and Ohio have commenced to fill the markets with hundreds of carloads of their superb celery, the Northern market gardener has, in some respects, been injuriously affected by the competition. However, the greater supply of fresh vegetables, through a greater period of the year, has materially increased consumption, especially in the smaller towns and cities. The occasional oversupply and consequent low price, give even the very poorest people an opportunity to purchase vegetables other than potatoes and cabbage, and so in the end the local market gardener's trade is increased, although he must accept lower prices than he has received in former years. His profits must come through a better knowledge of his business that will enable him to produce larger and better crops at less cost, yet, as the greatest yield can only come from land heavily enriched and thoroughly prepared, there must be a considerable investment at the outset. Gardeners within access of a city-water supply avail themselves of these means for irrigation, as occasion may require, while others use windmills and tanks, but are seldom able to irrigate as fully as required in a hot, dry time when water is most needed. In some of the larger gardens, where extreme drouth for two or three weeks might mean the loss of thousands of dollars, steam pumps and full irrigation plants have been constructed at great expense. Thus, the most complete crops are assured and these gardens are turning out products far beyond anything ever thought of by our gardeners of former generations. The product of one acre of celery in Connecticut under the highest state of culture, and with irrigation, sold for one thousand and four hundred dollars in 1889, and there are many acres grown in mixed vegetables, or rotation crops, about Arlington, Mass., the proceeds from which are from eight hundred to fifteen hundred dollars annually. Similar instances of success could be cited in other sections.

Fig. 1. VIOLET BEDS AT MENLO PARK.

Fig. 2. CLEANING SMILAX SEED AT VENTURA.

THE FLOWER INDUSTRY IN CALIFORNIA.

NINETTA EAMES.

California has the climate and soil to produce specialties difficult to raise elsewhere. In fact in no other country matures with equal success such a diversity of rare flowering plants collected from every zone. Roses are in the largest demand, and after them, carnations, chrysanthemums, violets, sweet peas, tuberoses, lilies and asters. A majority of the roses and pinks destined for the cut-flower trade, are grown under glass, a precaution in no wise due to the climatic conditions, but resulting from the fact that hot-house blossoms are not imperiled by sun and wind and the boring of petal-loving insects. It is seldom, however, that artificial heat is required in these coast conservatories.

Owing to late improvements in transportation facilities, the cut-flower trade in California is markedly gaining ground. In April 1891, when the Orange Carnival was held in Chicago, there were sent from Los Angeles, two carloads of orange and calla blooms. To insure their perishable beauty, the stem of each blossom of the latter was dipped in melted wax before packing it carefully in moist cotton or moss. The perfect success of the experiment suggested to florists a new method of disposing of the immense annual surplus in this State of these superb flowers. Callas had heretofore been cultivated solely for local ornamentation, and the shipment of their roots. In suburban Los Angeles, San Buena Ventura and Santa Barbara, there are fields of fertile loam planted to callas which have proved more remunerative to their owners than the same amount of land set to fruit trees or vines. These calla meadows add an incomparable picture to a semi-tropic landscape, with their lush luxuriance of leaf and stalk, and their sumptuous display of upright, creamy chalices. The wide plantations of swaying pampas plumes, beyond these packed masses of green and white, are also a source of no small revenue to floriculturists in these sections. Other transportable flowers besides the orange, calla and plumes of the pampas, are shipped from California to Tacoma, Seattle, Salt Lake City and Chicago. Large consignments, also, of her native and imported plants are furnished Eastern and European gardeners. Thus, many of California's handsomest wild flowers have been introduced abroad, the favorites being the *Eschscholtzia*, *Calochortus* and *Romeya Coulteri*. One man alone annually supplies city dealers with a hundred thousand *Calochortus* bulbs which he uproots on the

mountain wilds of the middle and southern portions of the State. At Menlo Park, in the Santa Clara Valley, five acres of a once famous deer park, are reserved for violets, which made a splendid growth in the rich leaf mold under some of the finest live oaks on the coast. These violets are planted in rows three feet apart, and are occasionally irrigated during the summer. The season of picking the lovely favorites covers fully six months of the year, when the profusion of dainty blue, white and purple blossoms fills the patriarchal groves with a matchless odor. Chinese hands are employed to gather and arrange the violets for market. It is stated that three-fourths of the cut flowers sold by San Francisco florists come from this beautiful place.

Of the 4,659 florists' establishments in the United States, three hundred and twelve are owned by women, proving the adaptability of this occupation to the talents and energy of the weaker sex. California has her share of women who are practical seed and plant growers. A woman florist of Ventura has won for herself more than a local recognition. Her first large venture was in the raising of smilax seed, of which she annually produces from one hundred to one hundred and twenty-five pounds. The smilax is grown outdoors, and forms long, high screens of delicate, varnished green.

Fig. 3. CALLA FIELDS AT LOS ANGELES.

After the scarlet berries are fully ripened, the entire vine is cut off close to the ground and heaped into sheets of strong, coarse cloth, when the mass is thoroughly flayed. The bruised leaves and berries are then put into a tub of water and stirred about until the leaves rise to the top, and are poured off with the water, when the seeds at the bottom are taken out and carefully dried. This enterprising woman has, for years, shipped seeds, bulbs and plants not only to Eastern markets, but also to Europe, Australia and the Sandwich Islands. She cultivates eight acres, over which she is sole manager, assisted by her three daughters who have grown up in the perfumed atmosphere of this wonderful southern garden. These intelligent, flower-loving women do all their own weighing, packing and labeling, and their work in the seed room is quite picturesque enough for an artist's morning study. The most destructive of California's flower pests are the mealy bug, red spider, scale, green fly and mildew—all of which are sorely trying to the floriculturist.

[In the beautiful engravings herewith are shown a few of these charming scenes. In Fig. 1 is presented a view of a five-acre violet field at Sherwood Hall, Menlo Park; in Fig. 2 is seen the method of cleaning smilax seed at Ventura; and in Fig. 3 is presented a view of one of the famous calla fields of Los Angeles.]

DRAINING AS A REMEDY FOR WET AND DRY SEASONS.

DR. MANLY MILES, MICHIGAN.

In what are called bad seasons the diminished yield of crops may be caused by an excess, or a deficiency, in the water supply. It will be generally admitted that draining is the proper remedy for the bad effects of wet seasons, but it is not as readily seen that it is quite as efficient in promoting plant growth in severe drouths.

In order to clearly understand the significance of drainage in maintaining a high average productiveness of soils in both wet and dry seasons, it will be necessary to consider the behavior of water in the soil, and its relations to plant growth. There are three conditions, or forms, in which water is found in soils, one of which is decidedly injurious to farm crops, while the others furnish the supplies of water required by plants in their processes of growth. The water that fills the spaces between the particles of soil, and percolates freely through them by gravitation, when not retained by a retentive subsoil, is called "drainage," or "standing" water which growing plants cannot use. The surface of this standing water in undrained soils is called the water table, and it marks the limit of healthy root distribution in soils. The available depth of ordinary soils is therefore determined by the distance of the water table from the surface. By draining, this useless and injurious water is allowed to escape, the water table is lowered, and a greater range of root distribution is provided for plants. In wet seasons the advantages of draining are therefore obvious.

Plants obtain their supplies of water, almost exclusively, from that which is retained in contact with the particles of soils by capillary attraction, and gives the appearance of moisture when the soil is stirred. As part of this capillary water is taken up by the roots of plants, and other portions escape from fertile soils by surface evaporation, the supply must be constantly reinforced by capillary attraction which raises it from the strata below, against the attractive force of gravitation. The capillarity of soils, or their power of absorbing and conducting this capillary water toward the surface, where it can be used by plants, is quite as important in promoting fertility as the supply of food constituents to which attention is too often almost exclusively directed.

The third form of water in soils is the hygroscopic, or that which is in more intimate relations with the soil particles than capillary water, and cannot be detected by the senses. When an air-dried soil is exposed for some time to a temperature of 212° F. it

loses weight, from the escape of hygroscopic water. Under otherwise favorable conditions, vigorous healthy plants may, to some extent, appropriate hygroscopic water, when the capillary water of the soil is exhausted, but practically the latter must be looked upon as the chief source of the water supply required by growing crops.

In discussing the subject of fertility we have, then, two important facts established in regard to the relations of soil water to plant growth: 1st. Drainage water, or that which percolates through the soil by gravitation, is injurious to agricultural plants, and must therefore be removed by draining, when the subsoil is impervious, to furnish suitable conditions for the healthy and vigorous growth of vegetation. 2d. The water retained by the soil by capillary attraction is the main source of the water supply required by plants, and the conditions of soils that favor the absorption and circulation of this form of water must be looked upon as essential elements of productiveness.

When growing, or in the green state, about sixty-eight to eighty-eight per cent. by weight, of farm crops is water, but this represents but a small part of the water that is actually required by plants in their processes of growth. From experiments at Rothamsted, England, and by Hellriegel, on the Continent, it appears that for each pound of dry organic substance formed and stored up by ordinary farm crops, about three hundred pounds of water are exhaled and thrown off in the form of vapor by the leaves. Lawes and Gilbert estimate the average amount of dry substance produced annually, on some of their experimental wheat plats, at 5,600 pounds per acre, and this would involve the exhalation of eight hundred and forty tons of water, or nearly 7.5 inches in depth over the entire surface. On the same basis a crop of corn of sixty bushels would exhale nine hundred and seventy tons of water per acre, or the equivalent of more than 8.5 inches of rainfall. This water serves the purpose of a hod-carrier in bringing nutritive materials from the roots, and when it has served this purpose the plant has no further use for it and throws it off by the leaves.

When we consider the fact that this enormous amount of water is drawn from the capillary moisture of the soil, the significance of soil conditions that favor the absorption and circulation of capillary water, and allow an extended distribution of the roots of plants to make use of it, must be readily recognized. An abundant supply of plant food in the soil, or provided in the form of manures, will fail to secure good crops in the absence of soil conditions that are favorable for the free distribution of capillary water, that is so largely drawn upon by plants in their processes of growth. The capillarity of soils, or their capacity to absorb and hold water in a form available for plants, must then be considered as of the first importance in crop growing, especially in time of severe drouths.

A single example from the Rothamsted experiments will sufficiently illustrate the capacity of drained soils to hold capillary water, and the available supplies thus furnished in time of drouth. For nineteen years wheat had been grown every year on the plats named, without manure on Plat 3, and with barnyard manure, every year, on Plat 2. Samples of soil, to determine the amount of contained moisture, were taken toward the end of July, just before harvest, in a time of severe drouth, only one and one-half inches of rain having fallen since the first of the preceding May. Samples for comparison with these were taken in January following, after heavy rains:

Plats and How Manured.	*Yield of Grain per Acre.*	*Estimated Water Exhaled per Acre, by Crop.*		*Tons of Water per acre, in Soil to Depth of 36 Inches.*		
				July 1868 in Drouth.	*Jan. 1869 after Heavy Rains.*	*Difference.*
	Bush.	*Tons.*	*Inches*			
Plat 3, unmanured.....	16.62	260	2.3	746	1,564	818
Plat 2, barnyard manure	42.12	871	7.7	642	1,803	1,141
Plat 2, more or less than Plat 3.....	25.5	611	5.4	84	239	323

The much larger crop on the barnyard manure plat had drawn out about six hundred and eleven tons of water, per acre, more than the crop of the unmanured plat, and after the severe drouth of three months, the soil in July held, to the depth of thirty-six inches, eighty-four tons of water less than the soil of the unmanured plat. The January samples show that the barnyard manure plat had a greater capacity for holding capillary water, and the July samples show that it gave it up to a growing crop more readily than the unmanured soil.

One-third of the difference in soil moisture in July and January would have been more than sufficient to supply the water required by the unmanured crop, and three-fourths of the difference in soil moisture in July and January would have nearly supplied the crop on the barnyard manure plat. The practical bearings of these experiments must be readily seen.

IMPROVEMENT OF SOUTHERN LANDS.

W. F. MASSEY, NORTH CAROLINA EXPERIMENT STATION.

Under the general name of Cowpea or field pea we have in the South numerous varieties or descendants from two distinct species of *Dolichos*. One of these is *Catiang*, a native of China, and the other *Sesquipedalis*, a native of the West Indies. I am not sure that either species is now found pure. The purest form of the Catiang is the Black pea most commonly grown in North Carolina and Virginia. The varieties of this class are distinguished by bearing their pods in pairs on long peduncles elevated above the foliage. The Sesquipedalis varieties have longer pods, and hang beneath. The Black pea is most commonly grown here. The peas, or rather beans, are jet black in color, with a small white eye. It is about the largest in size of bean and is largely used here not only for cattle food and the improvement of soil, but as a common table vegetable. Several other sorts are grown under the names of Clay pea, Unknown and Whippoorwill. In my own experience I prefer the Black pea for its magnificent growth of foliage. It will climb by twining around any support that it finds in its way, and I have seen it in this way climb six feet high on rank weeds that happened to grow with it.

The Cowpea is the clover of the South, and for all the Southern seaboard is far more valuable than red clover, even if the clover would do well here in all sections. It will grow on land which would hardly sprout clover at all, and, if well supplied artificially with potassic and phosphoric acid fertilizers, will in one season change a comparatively barren spot into productive land. Grown in connection with the winter-growing crimson clover it furnishes a means for the rapid improvement of land in the South, which no plant can equal in the colder sections. In this practice the peas are sown in late May at the rate of two bushels per acre. By September they are ripe, and the leaves are falling.

Then the crimson clover seed is sown, at the rate of fifteen pounds per acre, all over the dying vines, which furnish just the requisite amount of shade, and the clover grows green among the dead pea vines all winter. In April it is in bloom, and by the last of the month it is in full seed, when it can be plowed under, and the land will be in condition to grow a good crop of corn. Crimson clover sown again among the standing corn in August or September, will give a good winter pasture and make a good preparation for cotton with the help of kainit and acid phosphates. Clover sown again between the cotton rows in September will give winter pasture in place of bare land and brown cotton stalks. Cowpeas sown again in May will make a magnificent crop of cow hay, or ensilage, in July, and the land then broken for wheat will be in condition to make a fine crop, and grow grass, if of a clayey nature; but if of a sandy nature like our coast lands, winter oats can take the place of wheat, and clover follow them sown on the stubble the next summer.

Treated in this way the cowpeas and winter clover can be made to feed a large number of cattle, and with well-fed stock, the road to big crops of cotton and corn is easy, and independence from the hard yoke of King Cotton open to any active and intelligent farmer. As I stated in a former number of the AMERICAN AGRICULTURIST, it is not new crops that the South needs, but better farming. The man who, at present prices, grows half a bale of cotton per acre, will do it at a loss, but the man who, by an intelligent course of farming, brings his land up to making a bale and a half, or more, can still find a margin in cotton on a more limited area, and can have at hand the milk, butter, beef, pork and grain which his cotton neighbor has to buy out of his half-bale per acre.

Harness for Training Colts.—A colt should never know how much strength he has until he knows how to use it. If he once runs away he is never a safe horse afterward and, while he may to all appearances forget it, there will come a time when he will run again, and the chances are that he will do much damage. The harness for breaking and driving colts should be extra strong and heavy. The reins and bit especially must be stout enough for all possible emergencies. A straight-bar bit is good enough for a steady horse but it cannot be depended on with fractious animals. There are numerous kinds of bits that are easy when a horse is steady, but so made as to hold the horse when he tries to run.

HOW ONE TOWN IS IRRIGATED.

J. L. TOWNSHEND, UTAH.

The simple method of irrigating directly from a cañon stream is very little known away from the Wasatch mountains. Any valley, gulch, or ravine extending up into the mountains is called a cañon, as is also every one of its side branches. Many of these furnish small streams which unite with the main water course.

About sixteen miles from the first springs on the divide or crest of the mountains, to where the foothills slope down into the mesa or bench land, is the mouth of the cañon to which this article refers. Here emerges the cañon creek, flashing in the sunbeams, and singing cheerily over its bed of stones and gravel. Here are the first water gates. At a narrow place which nature seems to

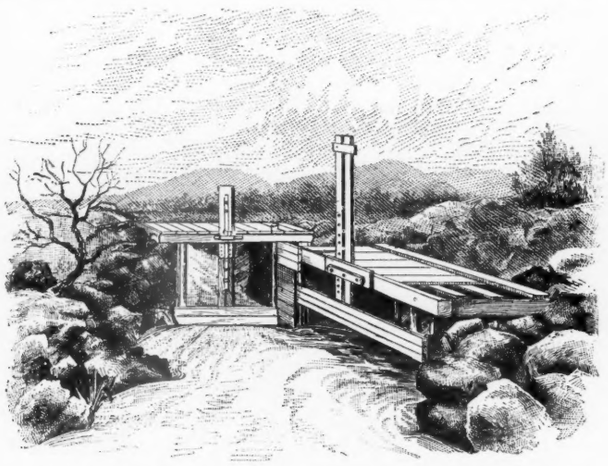


FIG. 1. WATER-GATES AT THE MOUTH OF PAYSON RIVER.

have prepared with kind forethought, a framework of planks and timbers is securely anchored by piles of rocks and stones. There are two gates dividing the water for the two main water-sects, set at nearly right angles in the bed of the stream. Further down each water-sect is divided and sub-divided into ditches that extend over an area shaped like an equilateral triangle, with its apex at the mouth of the cañon, and covering four or five square miles of town and country.

The town or city is incorporated, and owns and controls the water that comes from the cañon. A head watermaster is appointed by the city council, sub-watermasters are recommended by the

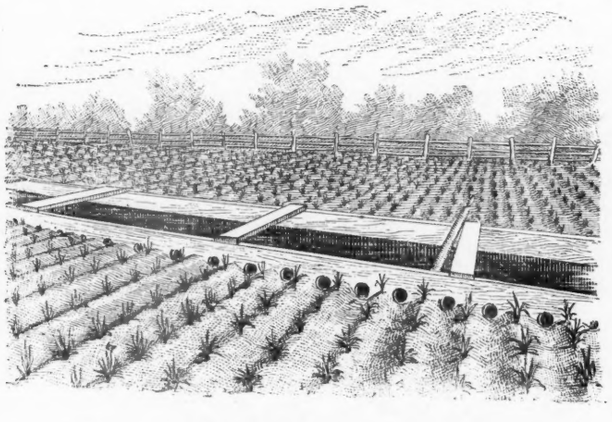


FIG. 2. IRRIGATION OF GARDEN VEGETABLES.

people and confirmed in office by the council. These are citizens who live near the ditches placed under their control. The water is apportioned to each ditch by the head watermaster according to the number of acres that are to be irrigated from it. The water to the city lots is divided on the ditches, allowing six hours to the acre about once a week. To the farm lands around and below the city, twelve hours are allowed for watering ten acres once a fortnight. The amount of water, when it is plenty in each city water ditch, would fill a boxed ditch about eight inches square. To the field ditches about four times as much is given. But the quantity of water is very varying with the season and by changes in the weather. About the first of May the sub-watermasters make out for each city lot and piece of farm land a ticket showing at what date and for how many hours the land is to have the water. This ticket is given to the occupant of the land, and a copy entered in a memorandum or record. As water flows night and day, including Sundays, irrigation has to be attended to all the time, every one in his turn. That some may not have an advantage over others as to choice of watering time the tickets are usually made to designate once a week or fortnight and from three to six hours later every turn, so that each has a turn in season at midnight and Sunday watering. Disputes about watering time are referred to the ditch watermaster. Stealing water from the rightful user makes the culprit liable to prosecution before a justice of the peace.

When the mountain snows are rapidly melting in April and May, and the cañon creek is swollen with the floods. the water is

FIG. 3. IRRIGATING DITCH DIVIDED WITH ROCKS.

turned into all the ditches and into high-water ditches leading out upon "dry farms" that have no water right. Large areas of good land for which there is no water in midsummer are then soaked with the life-giving waters, producing fine crops of alfalfa, rye and other cereals. Then, too, the meadows, orchards and lawns are made thoroughly wet to prepare the ground for the heat and parching drouth of summer.

From an ordinary city water ditch two to five rows of garden vegetables are watered at a time. much depending on the nature of the soil and its amount of moisture. When the ground is very dry

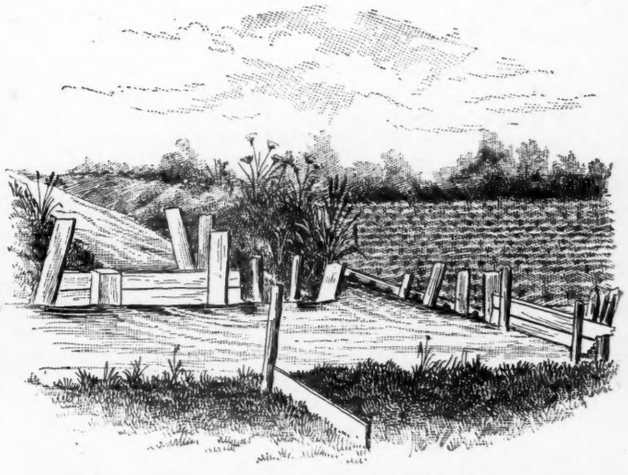


FIG. 4. IRRIGATING DITCH WITH BOARD WATER GATES.

more water must be turned into each row so as to flush it through. Allowing the water to run for five minutes in a row wets the ground very well and from ten to fifteen minutes soaks the soil like a very heavy rain. Gardeners who wish to use more water on their gardens than their water right calls for do so in several different ways. One is to purchase extra land and plant it to lucern or some other crop requiring little water, and direct the water from this area to their garden. Another is to purchase the water right from land that is occupied by business houses; and still another the sinking of artesian wells.

A garden to be easily irrigated must be leveled and prepared for the purpose. The object is to have just sufficient slant for the

water to run slowly through the rows. Head ditches across the garden from fifty to one hundred, or more, feet apart, help much to control the water and flush it through the rows of vegetables. Where there is naturally too much slant to the land so that the water would run too fast to soak in the soil, head ditches are run diagonally across, or straight down, and the rows planted in such a manner as to be as nearly level as practicable. This permits irrigation even on a sidehill. Water ditches usually run down the city streets on one or both sides between the sidewalks and roadway. Rarely the slope of the ground requires the ditches to be made across lots. At street crossings and across sidewalks in the central part of the city the ditches are boxed in. On the streets and walks of the suburbs they are usually left open.

Where the uplands are thoroughly wet in spring at high-water time, much of the water soaks down through the underlying strata and comes out on lower lands in an occasional spring and "seepage." Seepage is the moisture that oozes out on the lower farm lands and meadows between the mesa and the lake. It is not necessary to irrigate these lands; except perhaps during high-water time and rainy weather all the moisture comes from below. These lands produce the finest grade of very mealy potatoes, though not so many bushels to the acre as the irrigated fields. Here alfalfa, wheat, rye, oats, barley, and corn grow without irrigation, or may require one watering during the season. Wheat lands and fields of other cereals are laid out for watering with an implement similar to a corn-marker, with the teeth about two feet apart. Wheat is not watered till its condition shows it to be necessary. After heading out, water is withheld, as the wheat falls down if the land is then irrigated. Care is taken in watering all cereals to keep from flooding the ground, confining the water to the little ditches, as where the ground is flooded it bakes hard and stunts the growth.

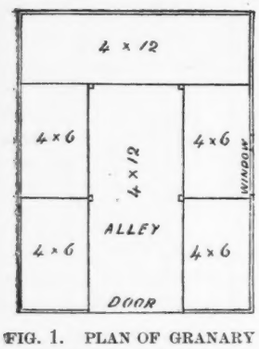


FIG. 1. PLAN OF GRANARY IN CORNER OF BARN.

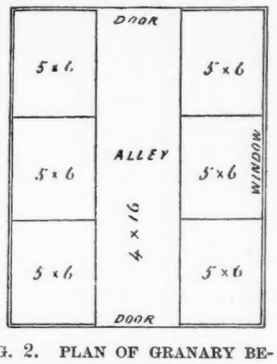


FIG. 2. PLAN OF GRANARY BETWEEN THRESHING FLOORS.

Corn is watered from one to three times according to the dryness of the season and condition of the soil. Potatoes are usually watered in field culture only when in blossom, and then abundantly. In low-lying fields the water is supplied to every other, or every third, fourth, or fifth row, so as to keep the crop moist by soakage from below the tubers. Irrigation seems to enrich the soil, and irrigated lands never become exhausted, even when little or no manure is applied. Fine manure is sometimes applied by throwing it into the ditches, allowing the water to spread it over the ground.

Lawns are the most difficult grounds to irrigate. But when properly prepared from the beginning they grow luxuriantly and are easily kept in order. A slant sufficient to run the water must be supplied to the ground that is to be made in a lawn. About double the usual amount of seed is then raked in than is used in the moist, rainy countries. After seeding, shallow ditches are made with the rake or any convenient tool, about one foot apart. The ground must now be thoroughly soaked, and watered again every two or three days. Seed should be sown as early in the spring as the ground can be worked. Water being abundant at this time of the year it is possible to have a good, green lawn in sixty days from sowing. Most of the lawns are watered from boxed ditches with holes in the sides about two inches in diameter and one foot apart. The shallow ditches, first prepared, soon fill up level. After the sod is well formed the water is flooded across the lawn from the side ditches.

In field and garden irrigating a great variety of contrivances are used in the ditches to turn the water from the simple pile of stones and earth to the large gates furnished by the city, and fastened with a padlock at the height desired by the water master. A notched plank across the ditch is the common gate in small ditches. Frameworks of various shapes and sizes, according to the taste of the builder, are everywhere to be found. Much time could be saved, and the water more easily controlled if the city were to adopt a system of iron gates that would not shrink and swell. The system of irrigation, here described, has been the outgrowth of necessity, without any plan in the beginning to work from, and all the ditches have been made and leveled when necessary by farmers, without the aid of a civil engineer.

[The principal features of this irrigation system are illustrated in the engravings on the preceding page. Fig. 1 shows the water gates at the mouth of Payson Cañon, looking down over Utah Valley. Fig. 2 presents the plan of irrigating garden vegetables from a boxed ditch. In Fig. 3 is seen an irrigating ditch, and the manner of dividing the water with rocks; and in Fig. 4 an irrigating ditch in a field, with simple water-gates of boards and scantlings.]

BINS AND GRANARIES.

After the entire season has been spent in growing and securing the crop of grain, it should be then well taken care of and not allowed to lie scattered over the floor or piled up in one corner of the building accessible to chickens, mice, etc. A granary is a necessity. Several plans, engraved after sketches by L. D. Snook, are shown herewith. That in Fig. 1 is twelve by sixteen feet and will hold nearly four hundred bushels of grain. One corner of the barn is the location most convenient for all purposes. There is a window at the side, four feet from the floor. The bin at the end of the alley is four by twelve feet. The alley is of the same dimensions and can also be used as a bin after the permanent bins are full. An alley should be large enough to be used as a storeroom, or for filling bags, a place for the fanning mill, etc. Make the door large and provide it with hasp and lock. Plan Fig. 2 is designed to be located between two threshing floors; it has a door at each end and two rows of bins on each side of the alley. When needful, one door is fastened and the alley filled to the opposite door. The front boards of all the bins are movable and easily taken out. Each set should be made to fit a certain bin and plainly numbered so there will be no confusion. The plan of fitting them in is shown in Fig. 3. On two sides of the standard *e* are nailed strips of soft wood *ll* one inch square. They form a groove in which the numbered boards or front of bin fit closely. These strips should be four and a half feet in length and fitted with boards to the very top. When the grain is being placed in, or taken from the bin, boards are added or removed, as required. Make a step, or platform, one foot high, one foot wide and six feet in length

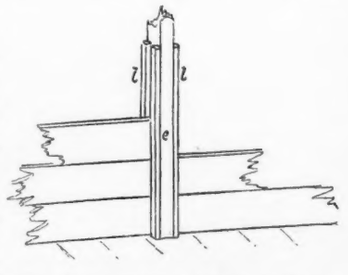


FIG. 3. MOVABLE FRONT BOARDS.

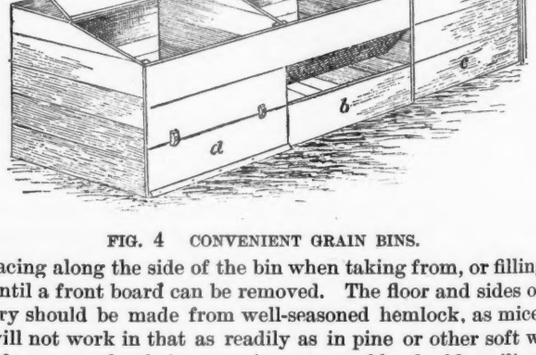


FIG. 4 CONVENIENT GRAIN BINS.

for placing along the side of the bin when taking from, or filling the bin, until a front board can be removed. The floor and sides of the granary should be made from well-seasoned hemlock, as mice and rats will not work in that as readily as in pine or other soft wood. Some farmers make their granaries rat proof by double ceiling and flooring and placing a covering of tin or wire netting between the boards. At the point where the granary is to be located, the foundation should be strengthened, for at times there will be several tons of weight on a small surface that often causes unequal settling and its consequent trouble. In Fig. 4 are shown plans of

grain bins, not located in a granary, that often prove convenient. They should be made to hold about seventy-five bushels each, and be four feet high in front and five feet in the rear. The bin *a* has a loose front board at the bottom, its upper side being held in position by two wooden buttons, the lower side is retained by a cleat nailed to the floor. When it is desired to remove the contents of the bin, the lower board is detached and the grain runs out upon the floor and is easy of access. The plan at *b* is intended as the oat or feeding bin; the board next to the bottom slants inward, as shown in the engraving. Bin *c* has the movable front. Many farmers are using bins of this form instead of a granary. They are easy to locate in a horse barn or other place where grain is fed. Bins should be provided with a cover, and can be made quite secure with a hasp and lock. Large and well made dry-goods boxes make fairly good, single, portable bins.

A COMPLETE POULTRY HOUSE AND YARDS.

The illustrations herewith, a sketch of which was sent us by Mr. John H. Caughey, of Pennsylvania, give an idea of a complete poultry building ample for the accommodation of two hundred fowls. It may be extended on the same plan to hold more fowls, but it would be preferable to construct other buildings rather than to overcrowd the birds in one. Two hundred birds to a single building are enough. The building and runs illustrated provide what is required. It need not be an elaborate building, but the plainest in its construction can be made to serve the purpose admirably. The general view is given in Fig. 1. The ground plan, Fig. 2, shows how the building is arranged. Each wing has twelve pens, ten by ten feet, each opening into the runs outside to accommodate ten females and one male. Nests can be built, as shown in Fig. 3, with lids to open and close, making a secluded, quiet place for a hen to go to and lay. Each pen has nests and roosts for its occupants, and every comfort. The pens are entered from the hallway *a* in Fig. 2. The center building is twenty by thirty-five feet. It contains large feed bins, *d*, carpenter's bench, *b*, stove, *c*, coops for sick fowls, *e*, and such fixtures as a poultry keeper finds necessary to have at hand. A number of coops in one part of the room make it possible to separate and treat ailing fowls when they become disabled from disease or otherwise. The height of the two wings need not be over fifteen feet at the peak. Some have buildings not over eight or ten feet. This will answer the purpose. The center building might be built twenty feet high, which would give an upper room in which the attendant could place a cot, and sleep when necessary. It could be used as a pigeon coop, and thus afford a very profitable and amusing pursuit in connection with poultry. Few farmers keep pigeons, and a building of this kind will afford an opportunity to do so and also to test their usefulness and beauty as pets.

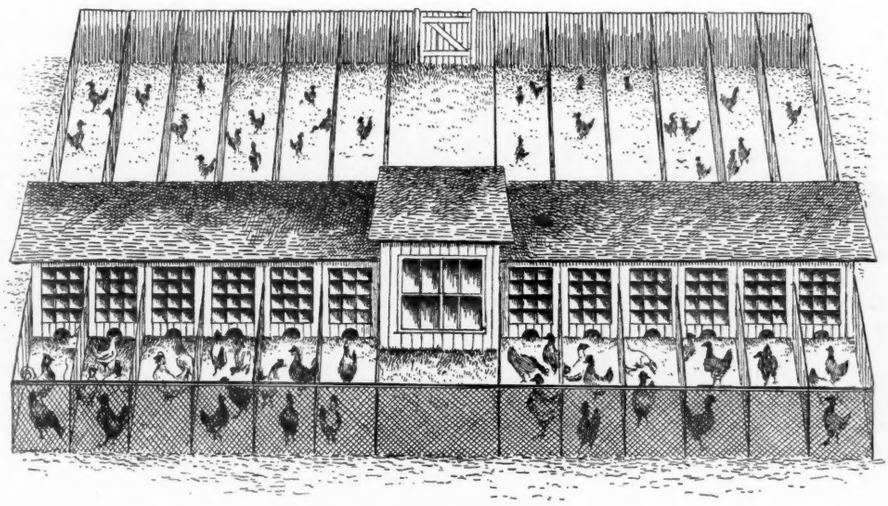


FIG. 1. PERSPECTIVE VIEW OF COMPLETE POULTRY HOUSE.

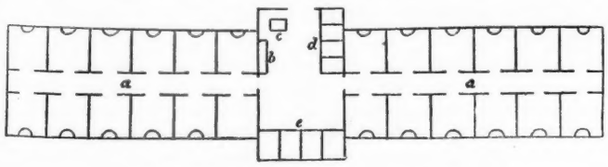


FIG. 2. GROUND PLAN OF POULTRY HOUSE.

Advantage of Small Pastures.—Two or three small pastures are better than one large one. The cattle may be turned out a week earlier, and, when one field is well eaten down, they can be turned into another. They can always have fresh grass if changed every week or two. The pasture will last longer and the cattle be better for frequent changing. Too many fences are not desirable, but a four or five-strand barb-wire fence may be built cheaply, or a movable fence used, and changed as wanted.

METHODS OF PRESERVING EGGS.

EUNICE C. CORBETT, ILLINOIS.

The whole secret of keeping an egg sweet and fresh is to keep the air from entering its pervious shell. If eggs could always be removed from the nests and put up within a few hours after they are laid, they could be made to keep their original sweetness for a surprising length of time. This, however, is only possible on the most limited scale, and those who pack eggs in any quantity must expect to use those of various ages, and to take the risk of putting up some already so permeated with air that no preservative process can check the work of decay within them. Before eggs are packed, or put in any preserving compound, they should be carefully tested by placing in strong brine, or by the "candle test," which is familiar to all. The best time to pack eggs is in March, April, or May, and again in the months of September, October, and November. Formulas of dry packing are now seldom used, and only on the smallest possible scale. The best substance for this purpose is coarsely powdered charcoal; the next best, clean, dry, sweet oats. One of the most common methods of preserving eggs is to soak them in a solution of lime. The advantage of this is, that the lime, by a thin deposit on the surface, protects the egg, to a certain degree, from the action of the outside air. This deposit, however, is of limited benefit and, itself, decomposes the egg, by percolating through the pores of the shell, and dissolving the albumen, or white, rendering it thin and watery.

Eggs which have been kept for a fortnight or more in warm weather, will usually spoil in less than a month after being dipped in lime water. If "strictly fresh" eggs are put in the lime mixture, they may be preserved about ninety days without material change, and can usually be kept through the summer months with only a partial decomposition of the albumen. When the white becomes watery, its specific gravity is lessened, and the heavier yolk settles down upon the shell, and by slow degrees the whole egg becomes putrefied. If the decomposition of the egg has begun, the use of the limewater will not check it. Other substances are sometimes used with lime to make it more effective, but, if we except common salt, none have proved to be of any real use. An excess of salt, however, hastens the decomposition of the white of the egg, and the hardening of the yolk.

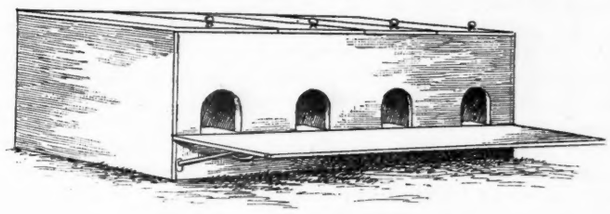


FIG. 3. NESTING COMPARTMENTS.

The formula for the usual lime compound is twenty pounds of fresh lime and one pound of salt to ten gallons of hot water, the amount needed to cover half a barrel of eggs. The "improved lime process," the invention of a commission merchant of a Western city, is less familiar. It is made by taking, for a barrel of eggs, or one hundred and fifty dozen, forty pounds of fresh, unslaked lime,

five pounds of pure tallow, cut in thin slices, and twenty gallons of boiling water. Mix these together in a tight barrel, and when the lime begins to slake, stir occasionally for an hour, and afterwards three or four times a day, for two days. A barrel should be filled with eggs, and this poured over them. The tallow will rise to the surface, and keep the liquid well protected from the air. The egg may be lifted out, for packing, in about eight days. When taken from this liquid, for packing in patent cases, each egg is covered with a saponaceous coating, which protects it very effectively from the outer atmosphere. Several other chemical mixtures have been used for keeping eggs. The best of these is silicate of soda dissolved in water. The eggs, dipped in this, receive an insoluble, glassy coating, which will keep them, if fresh, a long time. Diluted sulphuric acid is sometimes used. When eggs are dipped in this a few minutes, the acid forms a chemical combination with the substance of the shell, and coats the egg with sulphate of lime; but practically the shell is thus weakened, and the plan works badly. For the same reason alum, which is sometimes used, cannot be recommended, since it contains sulphuric acid. Alum is sometimes combined with the lime compound, but its acid neutralizes the alkali of the lime, and the whole compound becomes useless. Solutions of borax, a pound to a gallon of water, have been tried for keeping eggs, but have been found quite ineffective. At ordinary temperatures the eggs sour in this solution in about sixty days. Saltpeter and sal soda have also been experimented with; both of these agents act upon the egg in a manner similar to lime, though much more rapidly, causing the white to become watery, and the yolk hard, in about sixty days. Glycerine, which is a most valuable agent for checking the decay of animal substances, has been tried for preserving eggs. When diluted in the proportion of fourteen ounces to a gallon of water, it will keep eggs, immersed in it, for almost an indefinite length of time. But it penetrates the shell, and partially dissolves the contents, so that when the egg is broken, though it is perfectly sweet, it has a spoiled look. No better substance for keeping eggs, however, has ever been found than paraffin. This is tasteless, colorless, and inodorous; is a non-absorbent and a non-conductor of heat, and is not affected by air, cold water, alkalies, or acids. There are two ways of using it. One is, to heat the substance, and dip the eggs in it. The other is to use it cold, in connection with a silicate of soda solution.

Have a tight barrel or large keg half full of paraffin oil, and fill with eggs as long as the oil will cover them, allowing them to remain thus about two hours. Then draw off the oil by a faucet, and, after leaving the eggs for twenty-four hours undisturbed, pour over them a solution of silicate of soda. The oil left free in the barrel will rise to the top of the liquid and protect it well. Put a board cover on the barrel, place it in a cellar where the temperature is below 60° F., and the eggs will keep perfectly sweet for a year and more. If, just before pouring the soda solution over the eggs, twenty pounds of ice are dissolved in it, and then put in a cool cellar, the temperature will remain for six months and more below 50° F.

Those who deal largely in eggs find it worth while to deoxygenate them before using the preservative solution. This is done by putting them into an air-tight barrel, and exhausting the air from it with the air-pump. A vacuum being thus made in the barrel, the air in the cavity at the large end of the egg will escape, and also most of the air in the substance of the egg. Carbonic acid gas from a charged reservoir is then slowly admitted, and allowed to remain in the barrel for twenty-four hours. The next day paraffin oil is pumped into the barrel, the gas being allowed to escape at the same time. In twenty-four hours more the oil is drawn off, and the alkaline solution, previously cooled to a temperature of 40° F., poured on. It is claimed that eggs, thus treated, and kept at a temperature below 60° F., will keep unchanged for twenty years.

Rosebug Bait.—The object in planting spiræas in the vineyard or garden where grapevines are growing is for the purpose of attracting the rosebug or rose beetle. This insect, as is well known, is very fond of the flowers of the grape and will soon destroy them, and thereby cut off the crop of fruit; but they are also very fond of and seem to prefer the flowers of certain species of the spiræa. They will usually desert the grapes, and cluster upon the spiræas if afforded an opportunity, and, as these shrubs and herbaceous plants cost little or nothing, we may use them freely as bug traps or bait, and from which the insects may be shaken daily into hot water or a little kerosene and water. The two best species of the spiræa for this purpose are the Sorbus-leaved (*S. Sorbifolia*), a hardy, early-blooming shrub from Siberia, and the Goats-beard (*S. Aruncus*), a native vigorous growing herbaceous species. There are also several Japan species, with fine white flowers, and blooming at the same season as the grape that may also be employed for the same purpose, but the two we have named seem to answer every purpose.

COCKERELS vs. CAPONS FOR PROFIT.

GEORGE Q. DOW, NEW HAMPSHIRE.

Last season I made a careful experiment, to ascertain the cost of cockerels and capons, for food alone, leaving out all account of care, dressing, etc., as that is practically the same in both cases. The result was that I found it cost me just about nine cents a pound to grow the capons to a size suitable for market, while the cockerels cost twelve and a half cents a pound. I had always supposed it cost much less to grow a capon, but did not know until this time that the difference was so great. The cockerels, when dressed, averaged six pounds, and were sold for sixteen cents a pound, amounting to ninety-six cents each. Their feed cost seventy-five cents each, so that twenty-one cents represented the return for time, care, express charges and commerce. The profit I failed to find. The capons averaged eight pounds each, when dressed, and sold for twenty-five cents a pound, or two dollars each. Their feed cost seventy-two cents, so that I had one dollar and twenty-eight cents to cover expenses of care, dressing, express, commerce, and profit, and it did not take me long to see that they had paid a dollar profit each. All the birds received the same care and attention, and each lot was given all the good, sound feed it would eat, and their quarters kept clean. The capons were more easily cared for, as they were quiet and docile all the time, while the cockerels were forever on the move, and quarreling with each other more or less. The result of this experiment should be valuable to poultry-growers generally, showing what profits may be secured by the simple act of caponizing.

GROOMING THE FARM HORSE.

RICHARD WAUGH, MANITOBA.

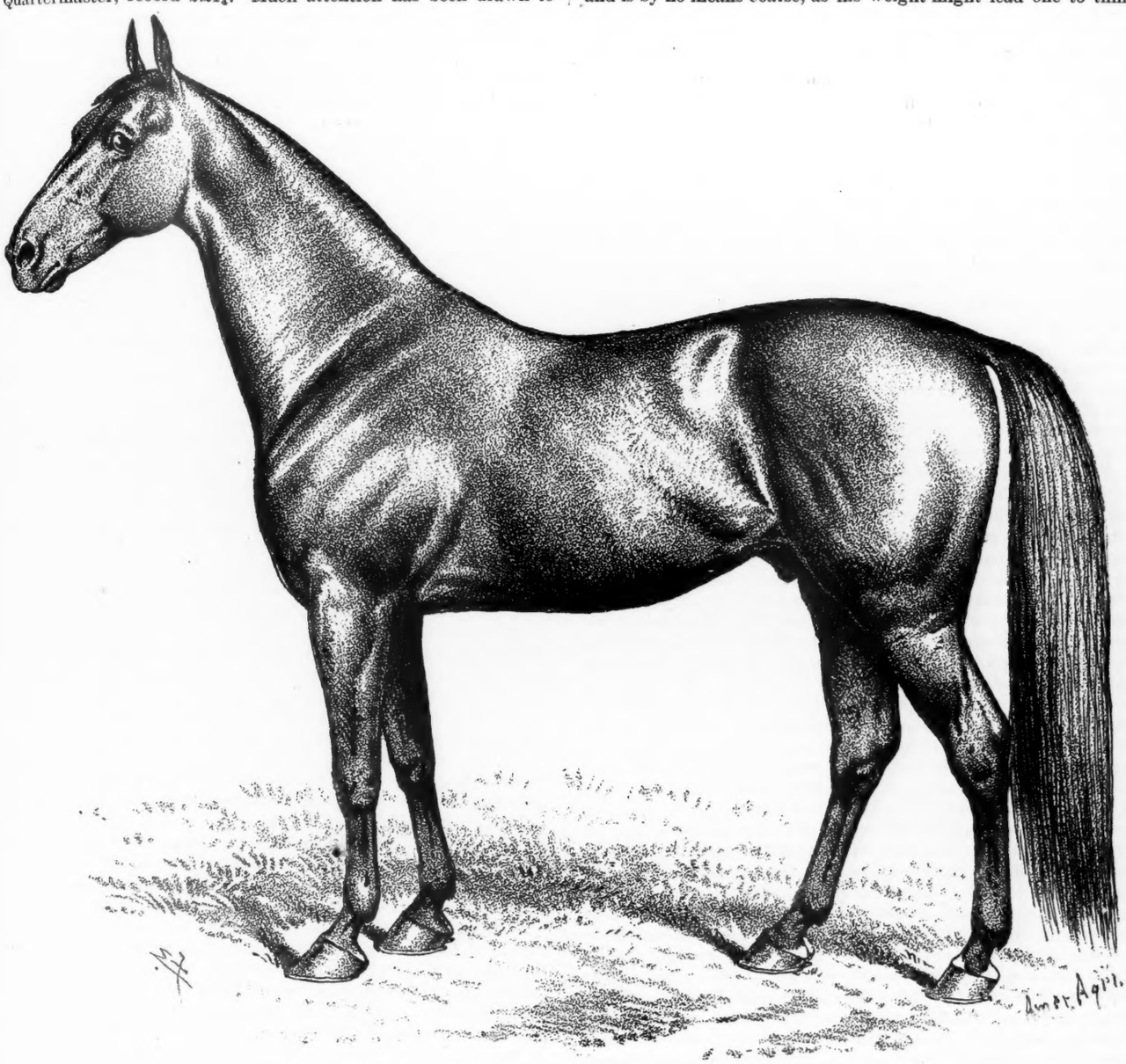
A horse that gets within a very few seconds of breaking the record is an object of great interest to a very large portion of the American public. Newspapers, whose special business it is to glorify horseflesh, give the details of his daily exercise in anticipation of a great race with as much minuteness as fashion oracles describe the ball dresses at a fashionable New York assembly. Baby McKee himself is not waited on with the same zeal and interest as is devoted to a record-breaker in the height of his achievements.

One-tenth of the care bestowed on a great sporting horse would make a farm horse feel too proud of itself. But there is little risk of such a horse ever feeling too proud from any such reason. A Scotch hired plowman grooms his team with a degree of loving interest and pride to which the average American farmer is almost a stranger, though the Clydesdale team belongs to another man and the man who works it is only a hireling, while the American generally owns the team and, as a rule, the farm as well. Why should not the more valuable beast, because the most useful, have a little of the warmth of interest bestowed upon him that is ungrudgingly bestowed on a 2:12½ trotter? The farmer who looks on his farm, his stock, and his other belongings merely as a means to make money, which he is reluctantly forced to stick to, will never find either profit or pleasure in his work. But the man who feels pride in his beasts, and has a kindly feeling toward them, is sure to turn the commonest drudgery into a source of pleasure, and make a good deal more money into the bargain. I went lately into a barn where a lot of farmer's horses were stabled after delivering their loads of wheat at the elevator. One team was in fine condition, and I complimented the young man who owned them. He told me they were eating nothing but oat straw and four quarts of oats at a feed. "Why," said the next man along "my team gets a peck of oats and good hay all the time, and they are very much thinner than yours. In fact, I cannot put flesh on them." The other man's secret was soon told. His horses were carefully blanketed whenever they went into a cold stable at the end of a trip to market, and when cooled in that way, were thoroughly groomed. That lad and his two brothers, who do the same thing, will have those same teams good to use and good to look at long after the present generation of unskillfully-managed and unwisely-fed beasts around them have been killed by pneumonia or some similar disease, and thrown to the wolves. Kindness even to a farm horse is a paying investment.

A SIRE OF GREAT PROMISE—QUARTERMASTER.

EDWIN C. POWELL.

The value of a trotting sire depends on the ability of his get to trot, his own record in this line, and his pedigree. With young horses whose colts are not yet old enough to train, their trotting record and breeding determines their worth. Heretofore soundness, color, size and disposition have received but little attention, and everything was sacrificed to speed. To-day breeders are awake to the fact that trotters are used very largely as gentlemen's road horses, and good color, size and other qualities are necessary. A horse that will get a uniform type of fast colts from all kinds of mares is especially valuable as a sire. A prominent representative of this class is Quartermaster, record 2:21¼. Much attention has been drawn to this horse within a year, for the reason that six of his colts entered the 2:30 list in one season, that being the first season that any of his get went in, and, furthermore, because he beat Mambrino King for the herd prize at the American Horse Show, at New York, last November.



THE FAMOUS STALLION QUARTERMASTER.

No other sire, at eight years old, ever had six in the 2:30 list to his credit, and they, too, out of all non-standard bred mares. This is certainly a wonderful showing, and great things may be expected of this promising young horse. Quartermaster has a fast record and good breeding behind him. He was foaled in 1883, and was bred by Dr. A. S. Talbert, of Lexington, Ky. His sire was Alcyone 732, record 2:27, and the sire of Alcryon, 2:15¼, Iona, 2:17½, McKinney, 2:12½, the fastest four-year-old pacer, and twenty-two others in 2:30 or better, another of which is a pacer. The dam of Quartermaster is Qui Vive by Sentinel 280, record 2:29¾, and her dam was Missie by Brignoli 77, record 2:29¾. Alcyone was a full brother to Alcantara, 2:23, and was sired by the mighty George Wilkes 519, record 2:22, whose sire was Hambletonian 10. The dam of Alcyone was Alma Mater, by Mambrino Patchen 58. Missie is the dam of two in the 2:30 list, and Alma Mater of five. A careful study of this pedigree will show what a grandly-bred horse he is, and that he inherits speed from both sides.

Quartermaster is a brown stallion, fifteen hands and one inch high, and weighs 1,040 pounds when in good condition. While he is a small horse in inches, he has a great deal of bone and substance, and is by no means coarse, as his weight might lead one to think. When three years old he was sold to Rundle & White, of Danbury, Conn., his present owners. When four years old he was shaped up a little by his groom and started in his first race, which he won, and took a mark of 2:31. The next year he went to Kentucky, where he won third money in a race trotted in 2:23½ and 2:24¼. A match race was made for him, which he won and reduced his record to 2:24¼. He was not trained again until in his seven-year-old form, when he showed miles in 2:17, halves in 1:04¼, and quarters in thirty-one seconds. He was started in but two races that year, and reduced his record to 2:21¼.

Two two-year-olds, two three-year-olds, and two four-year-olds are the colts of Quartermaster which have entered the list. His

daughter, Blue Bells, won the New England Breeders' stake for foals of 1887, and made a mark of 2:35¼, and her record at present is 2:23¼. Stanley, at fifteen months old, made a half mile in 1:28½, winning the New England Breeders' stake for foals of 1889, and his mark is now 2:29¼. The others in the list are Nyanza, 2:30, Quarterstretch, 2:28½, Lennox, 2:29¼, and Lessee, 2:29¼. His colts are all well gaited, of good size and shape, and black, bay, and brown in color. [An excellent portrait of this famous horse is presented in our engraving.]

THE SOW AT FARROWING TIME.

F. D. COBURN, KANSAS.

The degree of carelessness or neglect shown by many swine-raising farmers in the matter of caring for sows at and about farrowing time is simply amazing. To select the best from perhaps many litters, keep them until old enough to breed, incurring the risk and chief expenses necessary to their producing from five to a dozen vigorous pigs, and then, at the critical time of all the year, let them, by neglect or mismanagement, lose all, or most of what the future profit depends on, is lamentable. It is too often what causes the profit and loss account to balance on the wrong side of the ledger. There are various causes by which disaster is made probable before and at such times. One of them is permitting sows that are well along in farrow, to run, or bed with other stock. This practice renders the sows liable to injuries, such as being hooked by cattle, kicked, struck or chased by colts, mules or horses; piling up in nests or straw stacks with other hogs. Other evils are, allowing them to travel considerable distances over rough or slippery ground for food or water; letting them have their pigs when confined in an inclosure with other animals, or perhaps ramble off to some unsuitable, unsheltered corner, where the new-born pigs die of exposure. Others are allowed to farrow in a straw stack or deep trough-like nest, to the bottom of which the little rooters speedily gravitate in their earliest pursuit of sustenance, and where they are liable to be smothered or trampled to death by the mother.

For two weeks, at least, before the time for the pigs to appear, the sow should, if possible, be provided with more or less sloppy food, calculated to keep her system cool and bowels open. Dry corn and water are about the poorest diet imaginable for that purpose, or to encourage a generous secretion of healthful milk. She should be put in a comfortable inclosure, open to the sun, with sufficient shelter, where she may have ample time to learn to feel at home, and where there is neither danger nor annoyance from other stock. In the sheltered part of this she will need some bedding, yet not too much, as often a big, deep bed causes more loss than would result from none at all. Indeed, if the weather is genial, scarcely any bedding is necessary, but if the material is within reach, she will bring together a great quantity of it—enough to conceal herself in, and the pigs becoming entangled in it, perhaps lose their way on the first journey to find the teat, and perish from exposure, or eventually get wedged between its compact sides and the mother's back, and are crushed. The big, deep nest as a rule, will cause half the pigs of a litter to lose their lives before a week old, and that makes pretty expensive nesting. However the bulk of such bedding, if banked outside, against the north, east and west sides of the nesting place, would generally serve as an admirable protection from cold drafts. It is an excellent plan to have breeding sows tame and gentle enough to be handled. The advantages of this are never more apparent than at farrowing time. Generally a sow will give birth to her pigs in nearly one hundred and twelve days from time of service. There are two ways of determining with much accuracy when the pigs are about to appear. One of these is the sow's restlessness, and her industry in working with and carrying materials for a nest, though in some instances she may be doing this for two days before. The other is her giving clear milk on pressure of her teats. No matter what other signs fail, this one is sure; if she gives milk the pigs will soon be there to take it. If the sow is in good healthy condition, and has been judiciously fed during the preceding two weeks, this milk will be abundant, not too rich, and will agree with the pigs, giving them stamina from the start.

While it is altogether advisable to be in the vicinity, and know about what is going on, "meddlesome midwifery is bad," tending to make the sow nervous and irritable. What she will need to eat for two days following is not worth worrying about. See that she can find a drink of good water when she leaves the nest to look for it, and the third day some nourishing, moderately thin gruel will be appreciated, and beneficial in starting a flow of healthful milk. The pork-raiser who so manages his breeding sows that three days after farrowing, they can show an average of seven, or even six well-formed, lively pigs, has passed the worst of the road leading to success. The pig which has gotten through its first three days of life without mishap is rightly said to be well established in life with a fair prospect of a career of usefulness. Large litters are not desirable. If a sow has ten or twelve pigs, and all, except the best eight, are knocked on the head, the survivors will be worth more money than the entire ten or twelve would have been. No sow gives nearly enough milk for the larger number, and therefore all would suffer. In the first few weeks there is nothing which puts a pig so well on its feet as plenty of mother's milk. Cow's milk is the best substitute, but no other nourishes the pig like its own mother's. Farmers, in what are called the Northern States, are injudicious in permitting their sows to farrow before April 1st or 15th owing to danger of sudden cold storms. A new-born pig is almost as sensitive to cold as a baby, and, if once thoroughly chilled, gets a stay in his progress and prosperity, that, if not fatal, is for a long time injurious.

EXPERIENCE WITH RYE AS A GREEN MANURE.

JOSEPH SMITH, MICHIGAN.

When I bought my present farm of sixty-five acres in the fall of the year, I found it in a badly run-down condition. Not one acre of meadow was on the place, and the tenant declared that it was too poor to raise clover. I commenced by putting in the best portions of the farm to fall wheat, and the poorer parts to fall rye. During the winter I cut wood and hauled it down to the city, and when I could not get a load of manure given to me, I could usually buy a two-horse load for twenty-five cents. This I used as a top-dressing on the fall crops, very thinly, of course. In spring I sowed clover and Timothy seed on the wheat and so much rye as I had topdressed. This I followed with a forty-five-toothed steel harrow, which served the double purpose of covering the seed and fining the manure. The balance of the rye I left to grow as best it might till about the first of June. Then I proceeded to plow it down with a weed hook, or a chain fastened to the furrow horse's whiffletree and back to the plow. I then rolled and fined the soil to hasten the decomposition of the rye, and after properly pulverizing and again rolling, I planted it partly to potatoes and corn, sowing the balance to flat turnips. In August there was a good growth of bottoms. I pulled the larger ones to feed to the stock, as at this season of the year the pastures are suffering from dry, hot weather. Then I plowed down this mass of vegetation and again rolled and harrowed till time to sow to wheat. The next year there was no trouble in locating the line of the green manuring.

As soon as it was time to stop cultivating the corn crop, I sowed rye in the corn, cultivating between the rows with a shallow tool. This gave pasturage for all kinds of stock till the snow covered the ground. This item of pasture alone will pay the cost of labor and seed rye. Next year the rye was turned down, seeding to clover and Timothy. After digging the potatoes, I harrowed the ground down level and sowed to rye to plow down for corn or millet for fodder, taking off in time to prepare for wheat to be seeded down the following spring to clover. Sometimes I plant potatoes on every third furrow when plowing down the rye, and if it should be a dry season the potato crop will grow right along as the rye seems to retain the moisture. I have had potatoes thus planted that were green and flourishing weeks after all ordinary tender vegetation was blackened by the frost. In digging potatoes so planted, it is better to plow them out. It is enough to make a man enthusiastic to see the clean crop of tubers lying in a rich bed of decomposed vegetation. This plan of enriching the farm may be carried into the garden patch, taking off squash and other vegetables, and sowing to rye to plow down for the same kind of crops the following season. No matter if it does not come up that fall, it will come all right in the spring, and only be a few days behind the earlier sown crop.

Carrots for Horses.—Nothing is better for horses in winter than carrots. They help to regulate the bowels, make the coat shiny, and keep the horse in good condition. They seem to possess qualities which no other root or vegetable has. While being a rather expensive food to grow, yet they pay well. Two or three every day, or every other day, is all that it is necessary to feed. Plant a quarter or half an acre, or more, and put the rows wide enough to allow of cultivation with a horse.

BEET SUGAR AS AN INVESTMENT.

CHARLES R. BUCKLAND.

The importance of the beet-sugar industry to the United States is at present only fully appreciated in the Western States. It is true that some years ago two factories were erected in New England to manufacture beet sugar, but their failure was partly due to improper organization and management, and partly to imperfect and incomplete mechanical processes, so that they did not pay enough for beets to enable farmers to grow the crop. But the time has arrived when it is both desirable and imperative that Eastern capital should be utilized for the furtherance of a profitable and highly remunerative agricultural industry, which our Congress has had the foresight to foster and to stimulate. Capital naturally looks to the direction that returns the largest per cent. of interest for a safe investment, and it is the purport of the present article to show that there is no industry, either agricultural, commercial, or manufacturing, that is more attractive to the capitalist than the opportunity now afforded by the cultivation and manufacture of sugar from the sugar beet in this country.

No more striking example of the growth and success of the beet-sugar industry can be afforded than that of Germany, where the production of raw sugar increased from 186,442 tons for the season of 1871-72 to more than 1,200,000 tons for the season of 1890-91. Within two decades the growth was phenomenal. It was a growth of 645 per cent. in production, due solely and exclusively to the bounty system established by the German government to promote an agricultural and manufacturing industry for a commodity of life which could be raised on German soil, and which could be consumed throughout the universe. The increase in the German industry can best be seen from the following table, giving the figures for two periods:

Season.	*Factories in Operation.*	*Beets Worked in Tons.*	*Sugar Produced.*	*Molasses Produced.*
1871-72	311	2,250,918	186,442 tons	63,892 tons
1889-90	401	9,822,635	1,213,989 "	240,797 "

On sugar consumed in Germany there is a tax on the weight of the beets worked, and also a tax on the refined sugar, but sugar that is exported is free from both these taxes, and receives the government bounty. It will not be surprising, therefore, to see that the exports of German sugar increased materially, as follows, in tons:

Year.	*Raw Sugar.*	*Candy.*	*Other Hard Sugar.*	*Total.*
1876-77	46,218	7,393	4,342	57,953
1887-88	344,710	132,212	20,743	497,665
1888-89	412,424	164,151	15,650	592,225
1889-90	493,830	215,736	9,419	718,985

The bounty paid by the German government on its exported sugar is less than is being paid on sugar grown and manufactured in the United States. Having, therefore, this additional inducement of a larger bounty, together with a similarity, and in many places a great superiority, of soils for the growth of the beet, and other conditions being equal, it is self-evident that our American farmers are better situated to succeed than were the German sugar growers of twenty years ago. We are not obliged to export our sugar and incur heavy transportation charges in doing so, but can sell it at the factory door, there receiving the national aid. Furthermore, we have the advantage of starting with the twenty years of experience which the Germans have been acquiring in perfecting their mechanical processes. In 1871-72 it required thirty pounds of beets to produce two and one-half pounds of sugar, but it now requires only twenty pounds of beets to make the same quantity of sugar. That we can do this at the start, was shown by the operations of the Watsonville factory in California during its first season's operations in 1888, the product there being 1,640 tons of sugar of 2,000 pounds each, manufactured from 14,077 tons of beets, or 233 pounds of sugar per ton of beets, only nine pounds of beets being required for each pound of sugar.

There are two methods by which the price of beets is determined, one being on the basis of their saccharine contents, and the other at a fixed price per ton. The latter system is more generally in vogue, as farmers have no means of testing their own beets, and must depend upon the manufacturer for the amount of their payments. In the case of the Watsonville factory, during its first season the average polarization of the beets was 14.6, and the amount of sugar actually recovered was 11.65; that is, to say, out of an average of 14.6 pounds of sugar in 100 pounds of beets, 11.65 pounds of sugar was actually obtained for commerce. The factory ran for sixty-one days, employed 135 men, and manufactured 1,640 tons of sugar, of 2,000 pounds each. The actual cost of manufacture was 4.04 cents per pound, the price obtained for the sugar was 5.64 cents per pound, and the net profits of the season's operations amounted to $29,932.48 on an invested capital of $300,000, thus returning ten per cent. interest for the first season's operations. Cost of manufacture has probably been less since the first year's experience, and it is asserted to have been under three and one-half cents per pound at the Oxnard factories in Nebraska.

But no such returns or profits can now be relied upon. The duty upon imported raw sugar having been removed, the price of refined granulated sugar has fallen to a basis of four cents per pound which is all, or perhaps more, than the manufacturer could now obtain. The sugar turned out by a beet factory is not of quite so good a quality as refined granulated, and is usually sold at a shade lower price. It would be of the same grade as the Louisiana plantation refined sugars, and, on a basis of four cents per pound for granulated, would sell at three and seven-eighths to three and fifteen-sixteenths, less by nearly one-eighth to three-sixteenths of a cent per pound than the cost of manufacture as shown by the first season's operations at Watsonville. But, on the other hand, the factories being situated at interior points would have the benefit of the freight rate from seaboard refineries, thus about equalizing or more, the loss above mentioned. If the freight to Omaha were one-half cent per pound, a beet sugar factory situated there could charge this amount additional to the New York price, less a shade off for the difference in the quality of the sugar. Thus the manufacturer would always have the bounty as clear profit, and at some interior points an additional profit of from an eighth to half a cent per pound according to the ruling freight rates from seaboard points. The Oxnards, however, write that their sugar brings the full New York price for refined granulated, freight added, without the reduction allowed for above.

For the farmer there is no better paying crop than raising sugar beets. An average yield per acre is from fifteen to thirty tons of beets, which he sells at five dollars per ton. Taking the lower figure, his returns would be $75 per acre, and there is no other average crop that the farmer can grow to such pecuniary advantage. An outside estimate of the cost of raising beets, including seed and delivery at the factory, is $40 per acre, thus leaving net returns of $35 per acre. Beets, moreover, do not impoverish the soil. They must not be grown year in and year out on the same land, but as alternate crops, growing wheat, say, every other year. Beets must not be of large size, but should weigh from one to one and a half pounds each. Large beets are useless, containing as they do a superabundance of water and but little sugar. In growing beets, the farmer has an absolute guarantee of the price he will be paid for them, he is sure of his money within a week of delivery, and his returns are net cash, without deducting freight, commissions or other disbursements. That farmers, even in the Eastern States, are waking up to the advantages of sugar-beet raising as a highly remunerative crop, is shown by the efforts to establish the industry in Onondaga county in the State of New York.

Having shown clearly the relation of both farmer and capitalist in connection with beet sugar production, it is well to regard the situation more closely as allied to the government bounty, which will be payable for a further period of thirteen years, till July 1st, 1905. It is a case analogous to that of the Hawaiian Island sugar planters. By an exclusive reciprocity with the United States, they were practically paid, through the remission of our duties upon their sugar, a bounty of two cents per pound upon the whole of their product, which has increased, under a limited area of suitable soil, to an annual output of nearly 150,000 tons. This advantage is no longer secured by Hawaiians, as they are brought into direct competition with other sugar producing countries and on the same footing. But this privilege and advantage has practically been transferred to all Americans who are engaging, or may engage, in the business of sugar manufacturing, and even to a greater extent. They will receive clear the whole of the bounty, whereas a portion of the duties remitted to Hawaiian planters was deducted by San Francisco refiners. They will further have no freight charges, or commissions, to pay in disposing of their product, and these form no mean item of expense. The loss to the Hawaiians cannot be better expressed than by referring to their present efforts to enter into a free trade treaty with the United States. This would enable them to refine their own sugar at home and import the refined article into this country free of duty. Their loss is this country's gain.

To sum up: An investment of capital in beet sugar factories is no blind step. It has been clearly proved that, even at present prices in sugar, a factory can do rather better than pay expenses.

Even if it should not, it is at least assured of the bounty of $40 per ton. The cost of a factory is placed at $250,000, or say $300,000. A small output would be 1,500 tons of sugar, the bounty on which is $60,000. This is clear profit, an annual net return of twenty per cent. on the investment. The writer has, personally, every confidence that the actual profits from the workings of a factory will return an additional $10 per ton, or $15,000, thus increasing the net percentage of profit on investment to at least twenty-five per cent. per annum, after paying five dollars per ton for the beets. This is no visionary enterprise, but an opportunity such as is offered in no other country in the world. It builds up a gigantic industry, and capital practically receives a government guarantee of at least twenty per cent. interest on the outlay.

THE OUTLOOK FOR OUR LIVE STOCK INDUSTRY.

The annual returns of the United States Department of Agriculture as to the numbers and values of farm animals have had their substantial accuracy so well demonstrated by the results of the eleventh census, so far as published, as to lend special value to these statistics of the live stock on hand at the opening of the present year. We have, therefore, arranged the following comparison of the numbers of the principal farm animals on hand January 1st in each of the past seven years, including the census of 1880:

NUMBER OF FARM ANIMALS ON JANUARY 1ST.
[Last three ciphers (000's) omitted.]

Year.	*Horses.*	*Mules.*	*Cows.*	*Cattle.*	*Sheep.*	*Swine.*
1892	15,498	2,315	16,416	37,651	44,938	52,398
1891	14,057	2,297	16,020	36,876	43,431	50,625
1890	14,214	2,331	15,953	36,849	44,336	51,603
1889	13,663	2,258	15,299	35,032	42,599	50,302
1888	13,173	2,192	14,856	34,378	43,545	44,347
1887	12,497	2,117	14,522	35,512	44,759	44,613
1886	12,078	2,053	14,235	31,275	48,322	46,092
1880	11,430	1,725	12,369	20,938	43,577	36,247

Useful as the above data is, a still more significant showing is obtained by noting the percentage of increase in the numbers of each class of animals each year. It will be seen from the table below that the increase in horses and mules is proportionately less than in 1890 and previously. The increase in milch cows during the past year has been about a full average, and may make up for the falling off in 1890, as indicated by the returns at the close of that year. It was this decrease two years ago, as well as the drouth last year in the dairy sections of the West, that had much to do with improving the prices for dairy products.

The depression in the beef-cattle trade was marked by a considerable falling off in numbers, but the improvement in prices during the past eighteen months has resulted in carrying over more young stock than usual of recent years. Allowing for errors on this score in the apparent increase of over five per cent. at the opening of 1890, it is probable that the number of beef cattle is larger to-day than at the same date since 1887. Sheep have fluctuated more widely than any other stock, not excepting hogs. The latter show a larger percentage difference in numbers from year to year, but the figures are manifestly not nearly as reliable as in case of sheep, with the number of which flockmasters generally are more familiar than are swine feeders. The details of these interesting conclusions appear in the following table, which shows the

PER CENT. THAT THE NUMBER OF ANIMALS INCREASED EACH YEAR;
[The minus sign indicates a decrease.]

	Horses.	*Mules.*	*Cows.*	*Cattle.*	*Sheep.*	*Swine.*
1892	1.1	0.8	2.5	2.1	3.7	3.5
1891	1.1	—1.5	0.4	0.1	—2.1	—1.9
1890	4.1	3.3	4.3	5.2	4.1	2.8
1889	3.7	3.0	3.0	1.9	—2.2	13.4
1888	5.4	3.6	2.3	—3.2	—2.7	—0.6
1887	3.5	3.1	2.0	13.5	—7.4	—3.2
1886	4.5	4.1	2.4	4.7	—4.1	2.1

It is equally significant to compare the official estimates of the live stock supply with population. Thus we find that for each 1000 inhabitants in the United States there were of different kinds of farm stock on January 1st of the census years the following number of head:

	1890.	1880.
Horses	268	228
Mules	44	34
Milch cows	301	247
Oxen and other cattle	695	419
Sheep	836	871
Swine	974	725

It does not necessarily follow that prices are likely to be lower because the relative proportion of live stock to population is larger than ten years ago. Other conditions, notably the export demand, which was largely curtailed shortly after 1880, will come in play, to say nothing of the increased uses to which our live stock and their products are now put. On the other hand, the numerical situation of our live stock contains no features likely to warrant marked advances in values, which will continue to be governed to a large extent by the season and the crops. The increase in the number of cows is in one respect more apparent than real. Except in Indiana none of the great dairy States, having from a quarter of a million to one and one-half millions of cows, have materially increased their number during the past two years. Most of the increase has come in the newer States, and will but partly meet the increased consumption of dairy products. The great dairy States of New England, New York, Pennsylvania, Michigan, Ohio, Illinois, Wisconsin, Minnesota, Iowa, Kansas and Nebraska, have not added to their cows as fast as they have to their population, and there is little reason to expect that this year's marketable surplus of butter and cheese from these States will be materially increased from the average of recent years, unless the season should be unprecedently favorable for pasture with hay. Indiana and Missouri are the only dairy States of importance to which an exception may be made.

Sheep are returned at a higher average value per head than in any year since 1876, in spite of a greater increase in numbers even than two years ago, following a period of steady decline in numbers. It is interesting to note that the increase the past year has been heaviest in the Central States, the Northwest and on the Pacific Coast, with a considerable falling off in Colorado, New Mexico and the Southern States except Texas. Commercial estimates based on this data indicate a wool clip this year of 316,053,731 pounds in the grease, or 12,652,224 pounds more than last year. The wool will usually shrink forty per cent. in scouring.

THE NUMBER AND VALUE OF FARM ANIMALS BY STATES AT THE OPENING OF 1892.
[000's omitted in both number and values, and cents omitted in average price.]

	HORSES.			MULES.			MILCH COWS.			OXEN AND OTHER CATTLE			SHEEP.			HOGS.		
	Number.	*Av. Price.*	*Value.*	*Number.*	*Av. price.*	*Value.*	*Number.*	*Av. price.*	*Value.*	*Number.*	*Av. price.*	*Value.*	*Number.*	*Av. price.*	*Value.*	*Number.*	*Av. price.*	*Value.*
Maine	111	$80	$ 9,860				176	$27	$4,661	153	$25	$3,776	570	$3	$ 1,717	77	$8	$ 650
N. Hamp.	54	82	4,444				106	26	2,812	114	23	2,673	189	3	541	52	8	426
Vermont	90	76	6,894				239	24	5,823	165	22	3,687	358	3	1,179	75	8	587
Mass	64	104	6,728				176	32	5,774	97	26	2,495	58	4	224	63	10	652
R. Island	10	104	1,082				25	32	785	11	28	343	20	4	89	13	9	122
Conn	46	102	4,722				136	29	3,970	100	29	2,905	47	4	192	54	9	510
New York	659	89	58,927	5	$100	$ 515	1,552	26	40,637	776	27	20,693	1,421	4	5,402	673	7	5,036
N. Jersey	88	100	8,782	8	113	963	189	35	6,616	64	28	1,835	102	4	414	190	9	1,758
Penn	621	83	51,868	29	101	2,963	929	25	23,459	835	22	18,514	1,091	4	4,178	1,157	7	8,792
Delaware	25	84	2,144	5	107	515	31	26	799	28	23	651	23	4	89	53	6	338
Maryland	131	79	10,491	13	105	1,423	148	26	3,867	121	22	2,637	164	4	645	350	6	2,098
Virginia	246	74	18,407	37	89	3,319	280	22	6,235	419	17	7,233	449	3	1,370	978	3	3,597
N.Carolina	132	78	10,367	100	88	8,829	269	18	4,741	390	11	4,526	390	2	710	1,253	3	4,639
S.Carolina	61	87	5,285	86	95	8,257	155	20	3,148	204	13	2,629	89	2	168	684	4	2,828
Georgia	104	81	8,450	157	94	14,917	355	18	6,382	569	9	5,613	383	2	674	1,691	3	5,692
Florida	33	68	2,207	10	90	942	56	15	849	554	9	4,994	117	2	241	387	2	884
Alabama	121	69	8,485	136	86	11,784	312	15	4,677	445	9	4,006	269	2	444	1,499	2	4,356
Mississip'i	156	62	9,733	162	81	13,283	312	14	4,605	419	8	3,346	224	2	335	1,357	2	3,685
Lousiana	127	52	6,562	92	81	7,514	179	17	3,066	299	10	2,989	118	2	191	756	3	2,390
Texas	1,209	31	38,093	230	53	12,272	869	14	12,380	7,024	9	62,177	5,040	2	7,808	2,321	3	7,311
Arkansas	187	55	10,359	135	68	9,252	342	14	4,706	726	9	6,353	264	2	397	1,663	2	3,978
Tennessee	312	69	21,522	222	71	15,891	374	16	6,167	469	10	4,921	506	2	1,105	2,287	3	7,741
W. Virgin.	155	65	10,217	7	73	528	183	22	4,168	292	19	5,455	529	3	1,646	481	4	1,831
Kentucky	402	69	27,890	151	69	10,472	320	22	6,965	467	17	7,923	773	3	2,457	2,346	3	9,066
Ohio	888	75	66,658	19	81	1,546	783	25	19,585	872	22	19,559	4,468	3	14,724	2,851	5	13,258
Michigan	520	78	40,757	4	93	354	459	24	11,133	508	21	10,521	2,353	3	7,560	892	5	4,611
Indiana	725	73	53,388	56	76	4,342	657	23	15,276	1,085	19	20,925	1,161	4	4,299	2,586	5	12,787
Illinois	1,337	68	91,873	107	72	7,733	1,105	22	24,561	1,748	19	32,992	848	3	3,025	4,895	5	26,582
Wisconsin	464	74	34,442	5	82	439	702	20	14,414	836	16	13,749	908	3	2,688	1,109	5	5,925
Minnesota	461	77	35,309	10	84	869	577	19	11,112	642	16	10,187	357	3	999	592	6	3,429
Iowa	1,314	66	86,921	41	73	2,995	1,304	19	24,479	2,707	18	50,792	565	3	1,933	7,105	6	41,645
Missouri	951	57	54,892	249	63	15,811	869	17	15,220	1,928	17	31,821	916	2	2,355	4,632	3	16,583
Kansas	935	59	55,344	92	71	6,659	773	18	14,232	1,978	16	33,207	469	2	1,096	3,176	5	15,128
Nebraska	625	58	36,299	46	74	3,473	530	19	9,944	1,615	17	26,780	270	3	691	2,587	5	13,537
California	415	62	26,010	55	75	4,077	291	26	7,829	603	17	10,481	4,083	2	9,884	512	5	2,741
Oregon	226	44	9,911	4	59	281	106	25	2,653	797	16	13,090	2,456	2	5,491	227	4	981
Nevada	58	42	2,472	2	64	108	15	27	409	317	15	4,689	505	2	1,256	13	6	86
Colorado	161	51	8,339	5	79	413	60	26	1,570	1,038	16	17,112	1,710	2	4,264	23	5	131
Arizona	52	40	2,066	1	56	75	18	25	445	761	15	11,418	611	2	1,406	20	5	108
Dakota	402	136	27,198	16	171	1,388	198	40	3,904	682	33	11,331	590	6	1,861	370	12	2,168
Idaho	185	35	6,492	1	45	47	32	27	883	515	15	7,858	527	2	1,264	65	7	469
Montana	197	36	7,132	1	47	58	35	29	1,027	1,025	16	16,725	2,089	3	5,229	35	7	263
N. Mexico	93	29	2,704	4	43	162	19	20	375	1,288	11	14,179	2,967	1	4,556	25	6	146
Utah	67	35	2,414	2	54	111	54	22	1,210	403	14	5,679	2,055	2	4,650	49	6	416
Washing'n	171	59	10,019	1	70	96	97	35	3,381	447	21	9,345	687	2	1,859	152	6	987
Wyoming	100	34	3,422	1	70	98	13	32	429	1,107	14	15,910	11,141	2	2,808	11	6	66
Total	15,498	65	1,007,594	2,315	75	174,882	16,416	21	351,378	37,651	15	570,749	44,938	3	116,121	52,398	5	241,031

HIGH-BRED SHROPSHIRES.

The rock which our great flockmasters have split upon heretofore has been promiscuous breeding. Not alone was the error of no selection committed, but, worse still, the various families of sheep were crossed and recrossed until all originality was obliterated and a mongrel produced, which showed poor in flesh and meager in fleece. The most favored of the ovine family as mutton producers, are the South Downs and their near cousins the Shropshire Downs. The former are noted all over the sheep-growing regions of the world, and the latter can stand their own in public favor. Where pasture is plenty and winter keep assured these full-bodied sheep are more profitable than the smaller breeds. The Merino sheep lives on its native Sierras on scant provender. The Cheviot and Welsh mountain sheep feed where only a goat could follow. Their flesh is excellent, but as a lowland sheep they are surpassed by the Downs. The valuable qualities of the Shropshire Downs, are vigor of constitution, early ripeness of the wethers for market, and in the ewes marked fecundity; many produce twins, and as dams, are well capable of nourishing the lambs. Our engravings portray some remarkably fine specimens of this noble breed. In the foreground of Fig. 1 is seen the ram Ban Chief 4357, bred by A. S. Berry, Birmingham, England. He won the second prize at the Royal Agricultural Society exhibition this year. The sire was Monmouth Wonder 4094; dam by Harborough 2630. He weighed 342 pounds, and sheared nineteen and three-fourths pounds when one year old. The other rams in this group are hardly less attractive, but not more so than the ewes in Fig. 2, which have been selected by Mr. Geo. E. Breck, the owner of all the sheep here illustrated, with the special view of founding a flock at The Willows Stock Farm, Michigan.

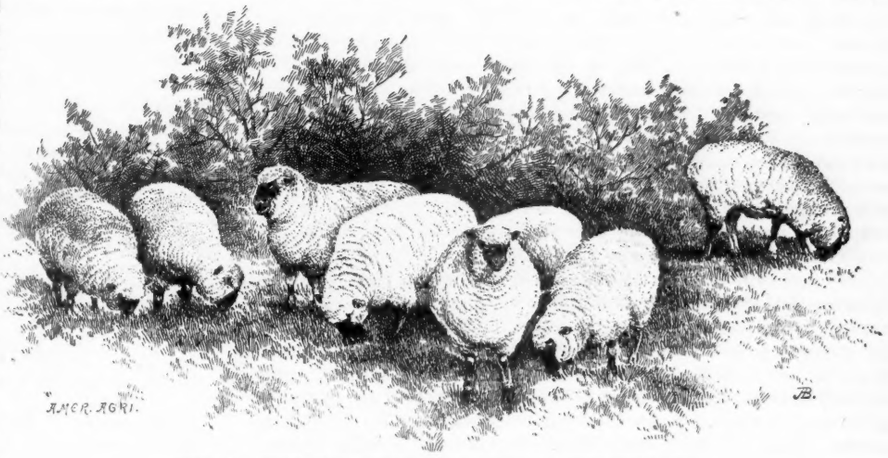


FIG. 2. SELECTED SHROPSHIRE EWES AT THE WILLOWS.

Selection of Cows.—Scrubs! is a common expression applied to common cows as a term of reproach. This may equally be applied to pure-bred cows when used to designate the real lack of value of the products of the large majority of almost any breed. No matter what that breed is; selection then is necessary in all breeds, as well as in the common cows. Any cow that will not yield a paying product above the cost of keep is more than worthless. She is a direct tax upon the owner to be got rid of. In buying a cow for dairy purposes, and depending largely on external appearances in making a selection, it is wise to place the greatest stress on the udder, the paunch, and the appetite of the animal. There should be a well-developed udder if a large quantity of milk is to be secreted. The teats should be set well apart and generous in size. Size of "milk veins," a golden color in the skin, and waxy horns are points well worth noting, but of more importance is a gentle disposition.

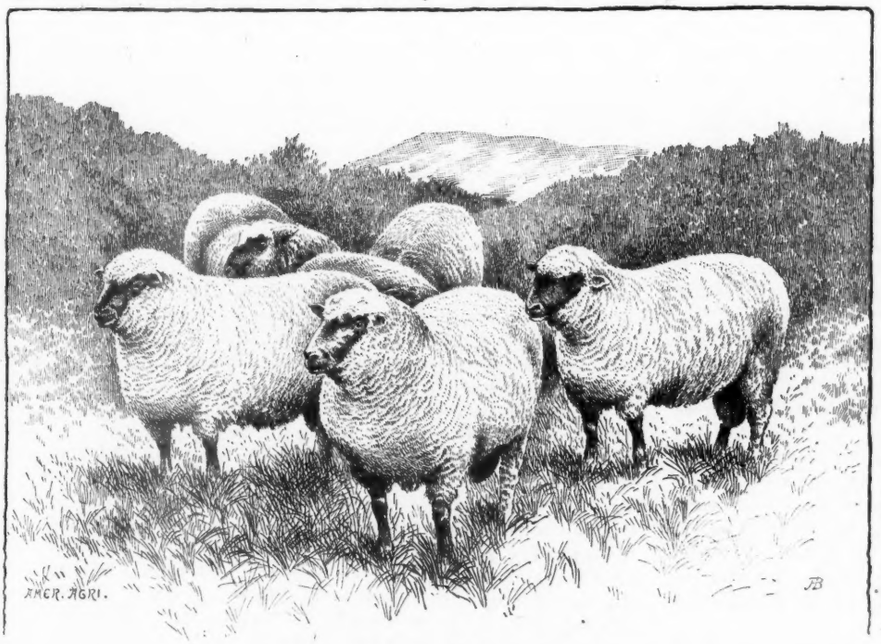


FIG. 1. PRIZE SHROPSHIRE RAMS AT THE WILLOWS.

BUCKWHEAT BRAN FOR MILCH COWS.

ELLA ROCKWOOD, MICHIGAN.

November 27th we began feeding eleven cows with buckwheat bran, five quarts to a cow, twice a day, without other grain. For coarse fodder they had cut cornstalks, fed dry, all they would eat. Five of these cows had given milk since spring, one was nearly dry, being due to calve in a few weeks, the others fresh at different times during the autumn. The bran was of good quality, weighing about eighty pounds to the two-bushel bagful. December 1st we had our first churning from this feed. It weighed thirty-three pounds when ready for market. The next was December 3d, twenty-seven pounds, again, on December 5th, twenty-two pounds, and last, on December 8th, twenty-seven and one-half pounds, making a total of one hundred and nine and one-half pounds. A change was then made to ground corn and cob one part, ground oats one part, and wheat bran two parts, mixed and fed in the same quantity as the former ration. The result was as follows: December 11th, churned thirty pounds; December 15th, thirty-three and one-half pounds, December 17th, twenty-one and three-fourths pounds, and December 19th, twenty-three pounds. Total, one hundred and eight and one-fourth pounds. Difference in favor of the buckwheat, one and one-fourth pounds, which might easily be accounted for by the natural shrinkage of the milk of cows that have been milked for a number of months. In both cases milk and cream were used as usual for the family. To say the least, it was a surprise that the buckwheat feed resulted so favorably, as we had considered that the mixed ration of corn, oats, and bran, was ahead of all competition as a butter producer. Here are some points which the test brought out: The whole number of inches of cream (measured each time in the churn, for accuracy of coloring) was thirty-nine for the buckwheat feed, and for the corn and oats forty; so that there was about five quarts difference in the cream in favor of the latter feed. If there was a difference in the quality of the butter, that from the corn and oats was the finest, it being firmer, more highly colored, and of better flavor. Practically the difference, as far as our test is concerned lies in the prices or, market value of the two feeds. If the buckwheat bran can be bought for less than the corn and oats, it is the better food. But if, as is generally the case, the dairyman grows his own grain, and wheat bran to mix with it can be bought for fourteen or sixteen dollars a ton, it is, all things considered, the better as well as the cheaper food.

PLANTING FOR IMMEDIATE EFFECT.

A. S. FULLER.

When I purchased a part of an old farm in New Jersey, which has since been my home, there was not a square yard of grass upon it, nor a fruit tree or shrub except those growing in hedgerows, fence corners, and in and around an old stone quarry in a corner near the highway. The outlook for a cozy home was anything but inviting, but it was in the country far away from the everlasting bustle and din of the city, and this was something to one who sought a quiet retreat and pure air, where he might build and plant to suit himself.

The first thing thought of after building a house and barn was a bit of green grass, and being somewhat doubtful about seed growing on an old worn sand bank, the roadsides were laid under contribution, and soon we had skinned enough of them to give us a few square rods of sward or just an edging of acres of lawn which I hoped to secure at less cost a few years later. The fruit trees and vegetables came next in order, and all, by much coaxing, flourished moderately well, but upon the approach of winter and as the deciduous trees and shrubs dropped their foliage, our surroundings seemed cheerless, cold and desolate, and the want of something green was not only seen but felt, for the cold northwest winds swept over the place, driving even the winter birds, squirrels and rabbits away to the woods for shelter.

My first winter here was enough in the way of experience to show me that evergreen trees of almost any kind would add greatly, not only to our comfort but to the general good appearance, too, of my grounds, so in the spring a special effort was made to plant as many as seemed desirable. Pines of various species, spruces, arbor vitaês hemlocks, balsams were selected, not omitting the Kalmias or laurels, hollies and other native undershrubs with evergreen leaves. Many of these were obtained from the woods, costing nothing but the labor of digging, hauling home and planting; others were purchased at a nursery a few miles distant. One week, with a team and three or four men, was sufficient to make a wonderful change for the better in the general appearance of my surroundings, and it has steadily improved ever since, as the trees increased in size, and new kinds were added.

At first novelties and rare species were not sought for, but those most readily obtained accepted, because the most common and cheapest would afford shelter and warmth as well as the rare and costly, and look just as green and cheerful when the snow covered the ground in winter, besides some of those usually classed among the cheap and common, like the white pine and hemlock, should never be omitted, even from the most select list of hardy compeers. The kinds obtained were planted freely in groups, rows and as single specimens, and as usual in such cases I sought "immediate effect," and in carrying out this idea several trees were planted where there would be room for only one to grow up to maturity. But, having confidence in my own courage to cut down a beautiful tree when it became necessary, rather close planting was the rule followed. For instance, in one group of Norway spruces planted between my house and barn, eleven trees were set, ten have since been removed, and the one remaining is about fifty feet high and the lower branches cover a considerably larger area than the entire eleven did when first planted.

During the first five years after planting, and as thinning out became necessary, we thought little of it, for a few strokes of the ax would cut a tree down, and to haul it away to the brush heap involved but little labor, but as the years passed and the trees enlarged, the cost of removal became greater, and now it is the work of hours, and sometimes days, to get rid of a tree twenty-five years old. Our ten minutes spent in planting have grown to ten or twice ten hours in its removal, and we are learning from some experience that planting for "immediate effect" may become a rather costly investment. It seems to be the general practice, however, in both private and public grounds, but the thinning out at the proper time is as generally neglected, and as a result all of the trees are ruined.

We have only to visit our public parks to see what "immediate effect" and "future ruin" means, and perhaps the two most striking examples of neglect are to be found in the Central Park of New York and Prospect Park of Brooklyn. In the former, the woodman's ax has been heard for years, cutting away worthless timber in the vain hope of saving a few fair specimens out of the hundreds that are being destroyed. In Prospect Park, however, the ax has not, as yet, been laid at the root of any great number of trees, although sadly needed, and every year it is delayed only increases the difficulty and will make the impending ruin the more complete. The crowding of a hundred trees into a space where ten would have been ample when planted, and even to produce the immediate effect sought, is now painfully apparent in the rapidly advancing ruin and decay of all. To thin out and remove the most worthless specimens at this time will call for an expenditure ten times the original cost of the trees, and when it is done there will be left a few long-legged specimens of the hop-pole type instead of wide spreading, beautiful trees such as nature produces when afforded room for development.

This very prevalent system of crowding and massing of trees and shrubs has not only been extensively practiced to the great detriment of nearly all private and public parks, but often extends to small gardens, where numbers of specimens is the ruling idea instead of perfect and fully-developed ones. The disastrous effect of the overcrowding of ornamental shrubs and trees becomes even more obvious in small places than in large, open grounds, where distance and massive effects make the defects of individual specimens less apparent to the passer-by. It would seem that we have plenty artists in ideas, but few of execution. There is no end of beautiful designs in landscape gardening, but whatever merit they possess is lost in transferring them from parchment to mother earth. To plan is one thing, to execute quite another, and the artist who attempts to design an ever-changing and progressive landscape must be able to look ahead, not ten years, but ten times ten, else his esthetic ideas will soon be enveloped in chaos and moldy ruins.

GRAFTING THE NATIVE PLUM.

PROF. J. L. BUDD, IOWA EXPERIMENT STATION.

The reading of the able paper by Prof. Goff in a recent number of the AMERICAN AGRICULTURIST, suggests some experiences during the past twenty-five years in the Prairie States, not wholly agreeing with his. He advises early grafting, but adds: "But if after the frost has left the ground, and the grafting has been performed, a period of dry freezing weather returns, the cions are liable to dry out to so great a degree that their power of absorbing moisture is nearly destroyed and death results." We often top-work the plum and cherry on pleasant days, in March, when the ground is solidly frozen and snow is yet lingering in places. Yet we have never known injury to the cions from the severe freezing we usually have after the grafts are set.

We have lost cions of all the orchard fruits by drying up when the insertion was followed by three or four days of dry southwest wind. But this is as liable to occur in top-working the apple in April, as in grafting the stone fruits the middle of March. When we do this work we watch the wet and dry bulb thermometer closely. If the per cent. of moisture in the air is low, we defer the work. If we have a sudden change, giving us a rapid moving air with a low per cent. of moisture within a week, we adopt the remedy of Mr. Sharp and cover the cions with paper sacks, tied down closely so as not to catch the wind. Indeed, the paper caps are far safer to use than waxing the whole cion as recommended by Prof. Goff. Taking one year with another during the past twenty-five years, we have had as uniform success in top-working the stone fruits as the apple or pear, if we succeeded in getting the work done before there was the least movement of sap in the stocks, and used cions a little dry rather than those which had absorbed water by being packed away in moss or sand.

In regard to root grafting the plum, the remark is made, "From my experience last spring in root grafting the plum, I infer that it is wise to keep the grafts moist, so the buds are slightly swollen at the time of planting out." His experience on the one occasion seems to warrant the belief that it is best to have the buds started when set in the nursery; our long experience does not favor this belief. We do not permit the grafts to get dry, but we keep the cions dormant by keeping the root cave very cold. At this time the top of the earth in the graft boxes is frozen, and we will keep it so as long as possible by opening the cave in the early part of the evening, during cold nights. Root grafts are usually kept too warm. We have had the graft boxes frozen solidly without showing any apparent injury. But we prefer to have only the tops and sides of the boxes frozen. With low temperature, the cherry and plum grafts grow uniformly, when not a trace of starting is seen in the buds. Low temperature in the graft cave is also a certain preventive of the fatal graft-box fungus, and the only one known to the writer.

THE FAMOUS UNION COUNTY ROADS.

EDWIN RALPH COLLINS.

The New Jersey Legislature passed a law in 1889 empowering the board of freeholders in any county to set aside certain roads as county roads and take charge of them, the cost of maintenance to be borne by the county. The boards were empowered by this act to issue county bonds to raise money to put the roads in condition as first-class highways. The freeholders' board of Union county were the first to take advantage of this law. They selected thirty-five miles of road, the main highways through the county, set them aside as county roads and voted to issue bonds to the amount of $300,000, to pay the cost of macadamizing. At this action, a wail went up from the farmers. Such unprecedented extravagance would plunge the county hopelessly in debt, raise the taxes above boiling point, and ruin them all; such expenditure might be wise in a county like Essex, including large cities, but to entail such a debt upon Union was rank idiocy. Nevertheless, the freeholders pushed the preliminary work steadily forward, sent the engineers over the ground and took bids for the work, which was portioned into sections. After the work was under way the board was confronted with the fact that $300,000 would not complete the work undertaken. The dilemma had the usual two horns — leave the work incomplete, or raise more money. The opposition was strong, but they concluded to raise the money and finish the work as originally planned, so additional bonds for $50,000 were issued, making a total of $350,000. At the extra issue of bonds the dissenters settled down in silent despair and waited for the result.

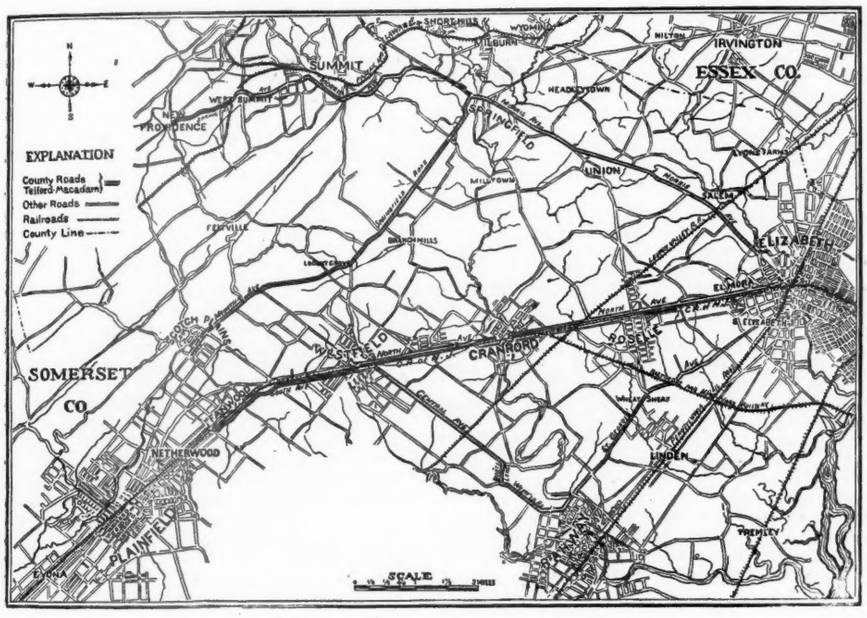


FIG. 1. PLAN OF THE UNION COUNTY, N. J., ROAD SYSTEM.

It is now nearly a year since the completion of the roads that give Union county the finest highways in the country. From Elizabeth, the county seat, they branch out in fan-shape through the county, to Rahway, to Plainfield, to Summit. At Elizabeth and Springfield they join with the Essex county system, that goes through Newark and the famous Oranges, giving fifty miles of first-class road between the extreme points, from Pine Brook in Essex county through Montclair, Orange, Newark, Elizabeth and Plainfield to Dunellen in Union county. Then the intersecting roads from Elizabeth to Rahway, Rahway to Westfield, Westfield to Fanwood and Scotch Plains on the west, and Springfield and Summit on the east, all combined, render any part of the counties accessible at all times of the year. The roads are always in good condition, mud has no terrors for the teamster or coachman, and the weight of the load is only limited by the strength of the team.

Now that the roads are built and have been in use nearly a year, it is difficult to find a farmer who opposed them. When you do find one who admits it, he blushes to acknowledge it. At all seasons and at all times, the markets of the city have been accessible to him. If he had anything to take to market, he was not compelled to hurry it thither in poor condition before the winter storms made the roads impassable, or to hold it until spring, when there was no demand for it. For the same reason the farmers were not compelled to rush all their produce into market at the same time, overstock the market, and consequently run down prices. The supply has not overrun the demand, and for all kinds of produce sold by the Union county farmers in the markets of New York, Newark, Elizabeth and Rahway prices have been steadier and the general average higher the past year than before. This statement

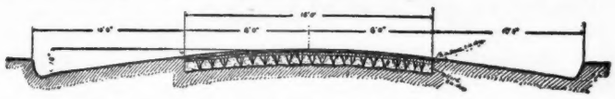
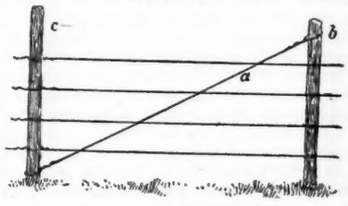


FIG. 2. CROSS SECTION OF TELFORD-MACADAM ROAD.

is not made off-hand, but is based upon actual investigation. Then, the farmer has been benefited again in the rise in the value of property. The good roads have proved an attraction to a class of residents who do not look to the farm for a livelihood, but are ready customers for farm products. A man doing business in the city can live two and three miles away from the depot, when he knows that at all times of the year he has a good, solid road from his door to the depot. What is three miles to an ordinary horse on a macadamized road? These roads have made every part of the county desirable as a place of residence for business men. Land, that before these roads were constructed, went begging for a purchaser at $100 an acre, finds a ready sale at $175 and $200 an acre, and there is not much offered even at that figure. Farming is profitable now where it was a losing business before. The increase in land values alone would pay the cost of the roads many times over. Taxes are a trifle higher, but no reasonable man would object to paying a few dollars more tax, when his property has been doubled in value. I have yet to find the man who says the roads of Union county are not the best investment the county ever made. The roads themselves are, strictly speaking, Telford-macadam, the foundation being according to Telford, and the finishing Macadam. In laying the bed an excavation was made eighteen inches deep and twelve feet wide. In this trench the foundation stone was carefully placed by hand by experienced workmen. Closely and compactly over this a layer of coarse crushed stone and a sprinkling of earth was placed, and the mass rolled compactly. After this had been rolled sufficiently, the topdressing of fine stone was scattered on the road, rounded up and rolled solid. This road withstands the action of frost, and is always dry. After it is laid, the cost of keeping it in repair is nominal, fine crushed stone being put on the low and wornout parts and then rolled. There is not so much exaggeration in the statement of the old farmer, that "every one of Union county's macadamized roads is worth more than a railroad."

STRENGTHENING THE GRAPE TRELLIS.

The constant change of temperature causes the trellis wires to expand and contract, and the heavy winds during the growing season when the vines are heavily laden with foliage and fruit, all conspire to loosen the end posts of the trellis line; hence, the posts need to be set deep and firm and otherwise braced to stand the strain upon them, and to this end the plan shown in the illustration is practiced by many vineyardists. At each end a wire *a*, is attached to the first post *c*, near the ground, and to the top of the second post *b*, as shown in the sketch. Where the trellis line is a long and heavy one, a wire is attached near the bottom of the second post and near the top of the third post. Of course by either plan the first post is not braced but, if firmly set, it will readily stand all the strain of the first space.



A STRONG TRELLIS.

Southern Life Since the War.

KEMP P. BATTLE.

The wealthy classes in "old times" were invariably slave owners. They were generally prosperous, the natural increase of slaves being of itself a source of wealth. This easy way of making money caused a habit of going into debt. At the same time that property in slaves was annihilated by emancipation, all the Confederate and State currency and bonds used during the war were likewise declared worthless. There was little left but land, mostly worn out by cultivation, and a few broken-down horses and tools, the owner encumbered with debt.

Under these adverse circumstances ex-slave owners behaved with much pluck. A few old people died at once of heart disease, but the most went manfully to work. Men who had never done a day's labor pulled off their coats and seized the plow-handle. Others surrendered their lands, and became teachers, insurance agents, lawyers, drummers, politicians. I grieve to say that many who continued to farm have not prospered. I only mention the chief cause of failure, namely, the enormous interest paid for the use of capital, amounting often to forty and fifty per cent. per annum, on account of high prices paid to commission merchants for supplies bought on credit.

And the soft, luxurious maidens, popularly supposed to be spending their days in perpetual flirting and swinging in hammocks under the beautiful trees of the Sunny South, what was their course in their changed condition? They went to work with hands and brains. The major part became teachers, not disdaining to take places in colored schools. I heard an ex-superintendent of the Baltimore city schools say that female representatives of the old Southern families were among the best teachers in the graded schools of Baltimore. The influence of their inherited refinement, grace and tact has been of inestimable benefit in molding Southern society. I remark here that the popular notion of the *dolce far niente* character of Southern women was always wrong. While unmarried they were certainly, in the old days, treated as only born to be happy, and to look beautiful, but after becoming heads of households, their task was a heavy one. The training of children and of menial servants, the providing for the food and clothing of a large household, the nursing and giving medicine to the sick of the whites and blacks, the dispensing a bounteous hospitality, the paying and receiving social visits, which in those days made large demands on time, the performance of multiform duties connected with the church and its societies, including attention to sick neighbors, these and other duties, made the Southern matron a hard-worked woman.

Emancipation has relieved her of part of these duties but has made her lot in other respects quite pitiable. As a rule our poor whites are unwilling to become household servants, and other white servants will not come South. The colored people desire to set up housekeeping for themselves, as soon as they get sufficiently forehanded. They have, besides, a spirit of unrest which leads to frequent changes of employers, especially if these employers are exacting. Southern matrons are much occupied in training raw and unskilled servants, who, as soon as they become really valuable, leave their drill-mistresses to confer the same thankless benefit on others equally as raw. I have known housekeepers to have as many as twenty successive cooks in one year. Sometimes by paying higher wages than usual families will retain their domestics for years, but often the offer of increased compensation makes the recipient so "bigotty," *i. e.* impudent, as to be intolerable.

The difficulties of the servant question have seriously changed Southern manners in the direction of diminution of hospitality. The entertainment of company demands slavish drudgery on the part of the lady of the house in order to "have things nice." All who endeavor to keep open house as of yore soon break down in health, and are forced to be more regardful of their strength. Those who live in large cities can get aid from professional caterers, but the inhabitants of thinly-settled communities have no such resource. Observers should therefore be slow in harshly criticising the decadence of hospitality.

I know many instances of the energy and pluck of Southern women since the war which were really heroic. I give one as a sample. The widow and only child, a daughter just grown, of an eminent and wealthy governor of a Southern State, were left without money, with only a naked rice plantation, unstocked with provisions, implements or animals. They were highly educated and accomplished. Their lives had been spent in luxurious living at home and in foreign travel. They were totally inexperienced in business. Their outlook was dark, as tenants able to support themselves while making a crop could not be had, and money could not be borrowed on mortgage except at ruinous rates, if at all.

These brave ladies did not despair. They opened a school for girls in a Southern city and so managed it as to attract a large patronage In ten years they made money enough to stock the farm and prepare it for profitable culture. They tried cultivating it by the supervision of a manager. They found that their share of the profits after paying him was almost nothing. They dismissed him and undertook the management themselves, and by judicious economy and wise direction they have recovered not only comfort, but wealth. They are of the very best blood of the country. The daughter married, lost her husband, and she and her mother, the latter a hale and hearty octogenarian, live together, splendid specimens of womanhood, ornaments and blessings to their community.

Now as to the white men

The war has had a renovating and educating influence, besides forcing the rich slaveholding class into new pursuits. As the South was mainly an agricultural country, large masses of the population lived remote from town, in all the seclusion and want of enlightment which in all ages have made the country the target of ridicule of the city. The exigencies of military service—at first the enthusiasm of volunteering, and then the conscription — carried the men into the great world. The green and awkward rustics returned from their campaign bright, active, quick-witted soldiers. Some could no longer endure the tedium of farm life. They moved to the towns, built up workshops and factories, engaged in merchandising and dairy farms, lumber getting, railroad building, or mining. They have as a rule been successful. Some of them are millionaires, who but for the compulsory education of the war, would now be intellectually and financially dwarfed by following the mind-depressing mule as he lazily turns up three inches of unfertile soil. Some of these soldiers stuck to their farms, introduced new methods of culture and better implements, fought the enemies of good crops with the same energy and pluck which they showed on bloody battlefield, and have conquered. They are now among the leaders of the farmers of the South.

Porcelain Table Service and How it is Decorated.

ANNA HINRICHS.

It must be admitted that the quality of a table service is neglected more than any other household adornment. Where ample means are at disposal, they are lavished upon magnificent furniture, tapestry, curtains, exquisite glass, and massive silver. Porcelain receives but little consideration. The delight of dining from a porcelain service, out of the usual line of French or English decoration, is rarely offered, even where means would allow. This, for some time, dormant inclination for beautiful china, is now awakened with characteristic intensity, and there is a general craze for rare table porcelain.

The gratifying effect of varying the pieces of a china service can hardly be imagined. That is, the shapes should be similar, but the color and decoration must vary throughout. Select sets of plates instead of buying the full service. Each course has its distinctive plates, matching in form but no two alike in color and design, save perhaps, in the border line. Such a table presents a brilliant bouquet of china, and the monotonous repetition of the same service is avoided. The most charming set of after-dinner coffees is composed of the dainty cups and saucers of the English or French factories, corresponding in shape but each different in color.

Really artistic and beautifully decorated china may be purchased at remarkably low figures. But, of course, nothing can equal the genuine hand-painted work. It is presumed that those contemplating the decoration of china, have some knowledge of drawing. To paint from Nature, make original designs. Even to paint from copy demands some talent in this direction. If this essential qualification be wanting, much may be accomplished through patience and perseverance by tracing the design. With the aid of the following directions concerning the mechanical part of the process any one of average skill may be the happy possessor of a hand-painted china service.

The specially-made colors for china painting are vitrifiable. That is, in addition to the coloring matter, they hold a vitreous flux, possessing the property of fixing the coloring matter under the action of the fire, at the same time heightening the brilliancy and durability of the colors.

China colors are in powder or tubes. The latter are a comparatively late innovation, although many still adhere to the former; for some purposes, as for laying of grounds, they are preferable. The chief objection to powder colors is the time involved in preparing them for use. The powder is first thoroughly rubbed down with a trifle of oil of turpentine, and then thinned with spirits of turpentine

Tube colors are far less troublesome. Most of them are ready for use without any preliminary preparation. A few, especially the carmines and whites, must be diluted with spirits of turpentine, adding a drop of oil of turpentine, if too difficult to lay. Precaution must be observed to avoid an excess of fat oil, as such a condition renders the colors apt to blister in firing.

Some artists advocate clove oil as a thinning medium, instead of spirits of turpentine. The color may be more easily laid with the former, but it is decidedly objectionable, because it is very slow in drying, causing tedious delay, unless the drying be hastened by means of an alcohol lamp. Others favor oil of lavender in a like capacity. All things considered, however, spirits of turpentine is preferable over all else. With its use the work dries rapidly, making it possible to finish a painting at one sitting. The parts first painted will become dry enough to work over, while other portions of the design are being commenced.

For rubbing down and mixing colors, use a palette knife of ivory or horn, or a glass pestle. This must be stringently heeded for colors having no iron in their composition. These are the whites, blues, and colors containing gold, which embrace lilacs, carmines, mauve, rose colors, violets, purples, and ruby. Under no circumstance may colors of a different manufacture be used on the same piece of work.

Sable brushes, medium in size, and with good points, are best. For tinting surfaces, large blenders are necessary. For surfaces, the brush should be an inch wide; for borders, in accordance with the desired width. Keep the brushes faultlessly clean by washing in alcohol. In cleaning large brushes the hair must be spread out and the fingers passed lightly over them until dry. Carelessness in this respect results in the hairs sticking together, and renders the brush unfit for further use. Care must be exercised in preventing any drops of alcohol from falling on the painting, as it immediately removes color. For the same reason avoid using a brush washed in alcohol before it is perfectly dry. Alcohol is used for the final washing of brushes, but turpentine must be kept close at hand for cleaning brushes while engaged at painting, and also for diluting colors when necessary.

It is well to have three—at least two—distinct sets of brushes; one set to be used exclusively with colors containing iron, the other to be entirely limited to colors containing no iron. Gold painting also calls for distinct brushes that have never been used with color. The slightest particle of color in the brush renders the gold dull and blackish. Surplus color or moisture is removed from the brush by touching on a muslin rag, which it is essential to have within convenient reach.

In preparing china for receiving the design to be painted, its entire surface is first rubbed over with spirits of turpentine. Set aside a few

moments to dry; then, with a hard lead pencil, delicately sketch the outline of the intended design. This must be done very lightly—just so it is visible—as heavy, dark outlines sully the colors, causing great annoyance in working, and often fail to disappear in the firing. Unsatisfactory marks in sketching the outline are removed by means of a sharp stick of soft wood, moistened with turpentine.

Colors will sometimes not lie well on highly glazed ware. A preventive in such a case is to wash the surface with soda, prior to the application of turpentine. The colors will then not flow away.

In mixing tints for borders, and also for laying grounds, it is imperative to use more oil than for other painting; also to mix enough balsam of copaiva with the color and other oils to prevent its drying before there is time for blending. The quantity of oil varies with the depth of the tint desired, and the particular color used. For instance, blue and carmine are more difficult to lay, hence they require more oil. It is quite impossible to give a fixed amount of oil to be used in each specific case. Actual practice soon simplifies this matter. Even though an excess of oil has been taken, it will not blister in firing if applied very thinly.

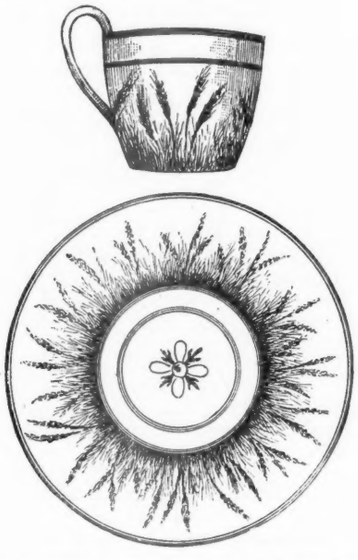


FIG. 1. WHEAT DESIGN IN GOLD OR BROWN THROUGH YELLOW.

Enough color to cover the entire surface must be used at once. Besides, it must be thin enough to flow freely from the brush without being so wet that it will run. When tube colors are used, dilute with turpentine, and mix with a little balsam of copaiva, to avert too rapid drying. In case dry colors are used, mix with one-half the amount of turpentine as of the powder (color), less than one-half that quantity of oil of lavender, and about twice as much balsam of copaiva. As necessary, dilute with spirits of turpentine. Mix on a glass slab, and rub down well with a muller until perfectly smooth. Then strain through a piece of fine wire cloth, lifting with the palette knife, to allow it to drop through. Do this just before using, that it may be free from any possible dust.

In tinting, a broad, flat brush is well charged with the color and passed rapidly over the surface. If it be a cup, hold it inverted, and make the strokes from bottom to top. In tinting the border of a plate, the strokes are made across the flat edge, from the center out to the circumference. For a vase, begin at the top, and pass round and round, with short, overlapping strokes.

After the entire surface has been gone over, wait a few moments, that the color may set. Then, with a blending brush go over the whole very carefully, not going twice upon the same spot. Hold the brush perpendicularly to the surface; do not drag, rather let it rest by mere touching. After a few minutes go over it again in the same way, blending the tint until it is perfectly uniform. So soon as a blender has been charged with color it must be cleaned in alcohol, and another substituted until it is dry. Any color that may have escaped over the edge of the object operated upon is carefully wiped away after the blending has been completed. A ball of cotton, tied in a fine linen cloth, is sometimes used for blending in preference to the brush. These directions apply only to the grounding of *delicate* tints. They are easily managed, and always pleasing.

To paint on a tinted surface, the ground must first be removed from the space the design would occupy. This is absolute, else the color of the tint will, in firing, mix with the overlying colors, with deplorable effect. After the tinted ground is dry etch on the contemplated design, and remove the inclosed ground tint with a scraper. Clean the uncovered surface with the end of a cloth, rolled into a point and moistened with turpentine. Following these tedious preliminaries comes the most fascinating part of china painting—the painting of the design. China painting is very like water-color painting, and the same rules apply to both. So far as possible, lay on the colors in broad, flat washes. Decided touches must be deftly placed, and not overworked. The real secret of success lies in at once placing each and every touch exactly where it belongs, and leaving it. Uncertainty of touch and overworking of a tint is ruinous. Finer work must be finished with stippling and lining, but is easily carried to an exaggerated extreme.

FIG. 2. FRAME FOR HANGING PLATES.

The final process, firing, is the most trying; actual experience is the best teacher of the effect of fire upon the various colors. The novice is recommended to work with the fewest possible colors, making the initial attempt upon some simple object. Fig. 1 shows an individual cup and saucer of Berlin design in wheat. The whole may be carried out in gold, or in browns through yellow, with gold bands.

The amateur is advised to select foreign ware, or be sure of the quality of home production. In works of art the decoration is foreseen, and the form coincides with the decoration. This is an important principle to be observed. Incongruous styles of ornamentation are highly objectionable. This difficulty is facilitated, however, because most of the ware sold for decorating is of simple shape, and not of decided styles requiring specific decoration.

The laws of form—unity, proportion, and harmony—also apply to decoration China painting represents a vast field for artistic conception. Harmonious arrangement of color is dependent upon individual taste. Subjects, difficult or simple of execution, are found in flowers, small fruit, fish (for fish sets), birds, and Nature, physical and human, although edibles from a platter adorned with the smiling features of a shepherdess are not relished by all. Moreover, portrait painting, or that of the "human form divine," is exceedingly

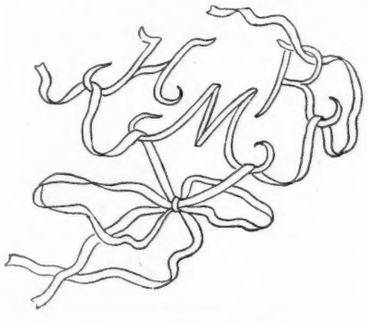


FIG. 1. INITIALS, H. M. R

difficult, especially on china, and should be attempted only by those of ability and experience.

Porcelain adorned with cupids, nymphs, human forms, or ideal heads, properly finds its place among treasured works of art and bric-a-brac, but for many and obvious reasons good taste excludes it from table service. Such painted porcelain gives color and cheer to any room. Its mission is in the capacity of a picture, and it should be hung where it can be seen. Fig. 2 pictures a safe device for hanging plates. It consists of two pieces of annealed brass wire, of the proper size for the weight of the plate to be hung. The longer piece is twisted into the ring for hanging, and down to a depth of from one to three inches, terminating in the two long lower arms. The shorter piece forms the upper arms, and is coiled about the former to admit of free play in adjustment.

Initials for Marking.

FRANCES H. PERRY.

Various designs of narrow fluttering ribbons, knotted in long-looped bows with streaming ends, are now seen printed on silks, woven in laces and wrought in many ways on numberless articles of clothing and ornament. A set of napkins and doilies, recently noted, following this fancy, were marked with the owner's initials, linked together by fluttering ribbons which were carelessly knotted just below the middle letter (see Fig. 1). The work was done in outline stitch with fine yellow etching silk, producing a beautifully-neat and clear sketch, as if drawn with smooth lines of yellow on the snowy damask. The same design, enlarged, would be appropriate for flannel garments or for the center of the ends of pillow slips. Fig. 2, similar in design, shows the effect of a more conventional style of lettering, and is worked in satin stitch. It is suitable for marking fancy articles of linen, silk or velvet. Either style would be

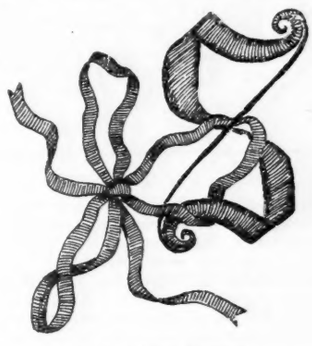


FIG. 2. SATIN STITCH.

just the thing for marking nice handkerchiefs of silk or linen, the ribbon bowknot design being an agreeable change from the standard floral and scroll patterns so long used.

Learn to Talk.

ANNIE HAMILTON DONNELL.

O, girls, learn to talk! I have been among girls a great deal, in fact was once a girl myself, and the folly of talking idle nonsense seems so plain to me that I would like to make my girl friends see it, too. I have known so many girls, bright girls, who were hiding their talents behind empty chatter and "joking," with their young gentlemen friends, making such foolish retorts and pointless little speeches, that I have wished they could see themselves as others see them. If they could, I am sure they would want to begin all over again, and learn to talk worthily of themselves, and of the friends they honor with their conversation. A truly witty rejoinder, a good pun, even a bit of piquant retort (always supposing it to be given respectfully and in order) these are the salt that savors speech.

But maybe you are looking puzzled over the "how" of learning to talk. It is well worth the effort, this rubbing up of your intellect. It is only a bit dulled from want of use Sterling silver keeps bright by being used. So, nothing disheartened, begin straightway the good work and show the duller coin of mankind how well a girl can talk.

Be well-read, if that means acquainting one's self as much as possible with the best that is in this wide-awake literary world, books, magazines and clean newspapers. Read them critically, forming your own opinion of their strong and weak points. Be original, and fight bravely for your opinions, but if your good sense detects their unstability, retire gracefully into the background, behind the wiser opinion of some one else. If a fine picture is on exhibition, and making a stir in

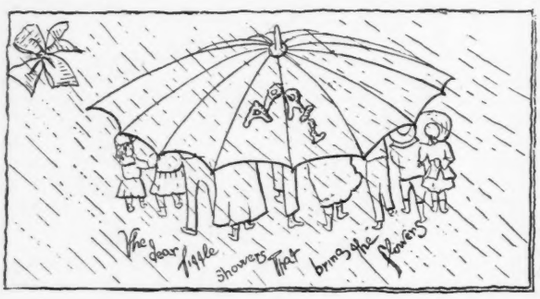
the artistic world, go to see it, if that be possible. If not, get acquainted with it and its creator through the medium of print. Be able to take a modest part in the talk about it when it is under discussion. If a book, lately published, is creating a name for itself, read it and be able to speak intelligently of it, when the time comes. O, there are a thousand and one ways of storing one's mind with valuable material for entertaining conversation by-and-by.

Make yourself as well informed as you can in all the happenings and writings and creatings of this lively nineteenth century. I am morally certain that you will be glad you spent the time in study. It is a work, or rather a pastime, that needs wide-opened eyes and ears all the time.

Now girls, don't you see, I just mean this: Have your ammunition stored up, ready, but don't burn your precious powder until you can hit the mark.

A Novel Blotter.

The "April Blotter" is made of blue blotting-paper, with the design outlined on it in a darker shade of blue paint. The blotters are tied together



APRIL SHOWERS.

with a bow of ribbon to correspond in color with the outlining. Nine by five is the size for this style of blotter.

A Flower Greeting for Easter.

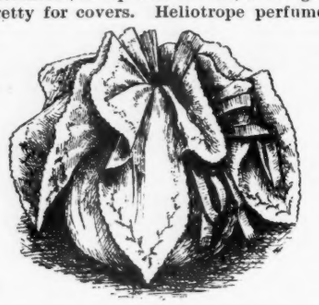
What can be more acceptable as an Easter greeting than fresh flowers? Accompanied by this dainty little holder, a few will show to good advantage. The holder for the shell is made of a circular piece of cardboard five inches in diameter, with a round hole in the middle measuring two inches in diameter; this piece is cut and lapped to form a collar. The depth it is glued over will have to be ascertained by the size of the shell which is to set in it. This piece is to be covered with plush or velvet with a frill of lace falling over it. If cream-colored lace is used, select a shell of the same tint; if white, choose a pure-white one. The shell will set in firmly without

FOR EASTER.

being glued in. Then it can be removed when necessary. "Easter Greeting" is put on with liquid gilt.

A Temporary Sachet.

In the middle of a fine, embroidered mull or lawn handkerchief place a soft ball of pink cotton containing sachet powder, gather up the corners and edges and tie with rose-colored ribbon. This makes a lovely sachet, which may be suspended by one ribbon loop beneath a hanging lamp, or in any other convenient place. It is a pretty way to give a nice handkerchief at Christmas. When the perfume has vanished it may serve the purpose for which it was originally intended. Little silk handkerchiefs, or squares of lace, or fringed silk are pretty for covers. Heliotrope perfume and



A HANDKERCHIEF SACHET.

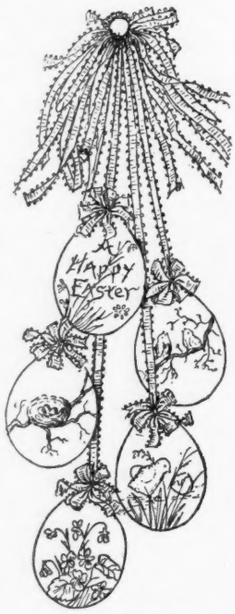
lavender ribbons, with a white or cream-colored square of mull or silk, would be pretty. The filling should then be white cotton wrapped in lavender tissue paper.

A Fancy Basket for Layette.

When the layette is in order for the new baby, the mother, however modest her purse, desires many tasteful little articles for the newcomer. To make these, at small cost, is to be able to gratify a perfectly laudable desire. Take a peach basket, rub it off with sandpaper, and line with cotton wool. Take a sufficient quantity of pink or blue silesia, paper cambric, or surah silk, and line the basket, fitting to the cotton wool. Put ribbon bows at each side of the handle and at the top of the arch, of the same shade as the lining. In the basket put baby's powder, puff-cup, soft flannel bandage, box, and scent bottle. Make a cushion of the same shade as the rest, and fasten to the ribbon bow at the arch of the handle. Placed upon the bureau or dressing table in the chamber, it makes a pretty ornament and always keeps these useful articles at hand.

Lead Rather than Drive.

Never swear at your boy; it hurts his feelings and lowers his self-respect. Kindly criticism is helpful, fault-finding discouraging. When he makes a mistake, show him the right way, but don't scold. If you should lie abed until nine or 10 A. M., don't tell your boy, "the early bird catches the worm." It will start him thinking why you never catch any. Old used-up harness, patched machines and sulky mules are not the right combination for a boy. Encourage your boy, if he does a thing right. After the first few times it will become a habit. Tell him that the way to control young stock is to begin by learning to control his own temper. Tell him if there are not millionaires on the farm there are more real homes, independence and solid comfort, and a good deal less worrying besides. Tell him that brainy farming is the best, but slipshod farming is better than starving in a tenement house. Finally, tell him if industry and perseverance won't tell on a farm, they won't tell anywhere else.



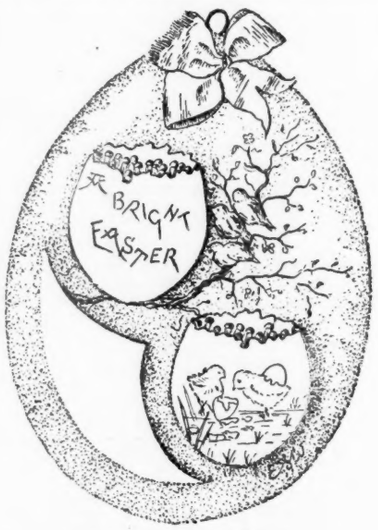
GROUP OF EASTER EGGS.

Group of Easter Eggs.

The group of eggs will be found very pretty to suspend from the gas bracket or on a lace curtain. If one cannot paint, the eggs will be quite as effective gilded in different colors and suspended on ribbons to correspond. For one, you will need five yards of "daisy" ribbon, five shells, a small quantity of scented cotton and a brass ring (also gilding, if it is to be used). Stuff bits of the scented cotton in the eggs and glue the little bow of ribbon over it; cover the ring with a crocheted silk cover and suspend all the eggs from it with narrow loops and bows of the ribbon.

A Match Receiver.

Cut a nicely-shaped egg out of heavy pasteboard. Cover it with plush on one side, and muslin on the other. Sew a brass ring on the top, and a bow to match the plush. Glue two eggshells and a piece of sandpaper on it, and with a little decoration you will have a useful as well as ornamental



A PRETTY ORNAMENT.

Easter gift to offer some one. The painting, although it adds somewhat to its beauty, is not essential.

A Ribbon Photograph Holder.

This simple photograph holder is made of a piece of five and one-half inch ribbon which measures fourteen inches in length. This is hemmed on one end; the other end is drawn through a crochet ring and fastened with a few invisible stitches to keep it in place. The other end is fringed out to the depth of one inch. The pocket is composed of sixty-three crocheted rings, which are joined together and attached to the ribbon on the sides and bottom. These rings

RIBBONS AND RINGS.

can be bought ready to use, or they can be covered at home, as they are merely brass rings (half an inch in diameter) with a crocheted covering of silk. They are pretty to trim shopping bags with, and are used largely now in the make-up for fancy strings.

Washing Lamp Chimneys.

M. H. TURNER.

Where lamps are used exclusively for lighting a house, lamp chimneys are quite an item of expense, and any hint on how to prevent their breakage will be welcome to all who have been troubled in that way. I have seen two or three in succession broken in one evening, in what was then to me the most unaccountable way. Our lamp mer-

chant said, "Don't wash your chimneys, but wipe them clean with dry cloths." That set me thinking. It is the damp then that does it, I said to myself. Why should that be? By a course of reasoning I came to the conclusion that if the chimneys absorb moisture and are damp in anywise when lighted, steam is soon generated in the pores, and we all know what steam does, an explosion occurs. That is why the chimneys fly so when they break. If you must wash them, dry them thoroughly in the sun or near the stove or furnace before using. Chimneys kept in the kitchen get damp on washdays and should be wiped before using.

Making Easter Cards.

Take a square piece of paper, bend the corners over, as seen here, and you will have the pattern for the Easter card, which is made of rough water-

AN EASTER CARD.

color paper, or it can be made of cartridge paper. The chicken is made of yellow plush. First cut one out of cardboard, one the exact size, of cotton, and one a trifle larger, of plush. Scent the cotton, lay it on the cardboard and draw the plush smoothly over it. Glue it down on the back, and also on the card. Shade it a little with brown paint. Do the lettering and grasses and also the turned-over corners with gilt.

A Stylish Made-Over Costume.

F. P. SCRIBBLER.

This pretty costume, which the originator calls her "home-grown gown," was ingeniously fashioned by a home dressmaker from the best parts of a worn cheviot suit and an ancient silk shawl, of a rich claret color, which had not seen the light of day for years. The patterns, too, were a year old, but, by a few easily made changes, to make them accord with the latest fashion sheets, they served her purpose as well as new ones could have done. For the bell-gored skirt, five narrow gores and a full back breadth were cut from the best of the old skirt which was full and wide. The corselet body, which hooks under the left arm, and the suspenders and straps were cut from the remaining remnants. The full waist, which closes invisibly in front, the sleeves and the pieces inserted in the bottom of the skirt to form underfolds, or "springs," where the bell-gores are left open nearly to the knees, are of the silk. The fulled silk of the waist extends only a few inches below

MADE AT HOME.

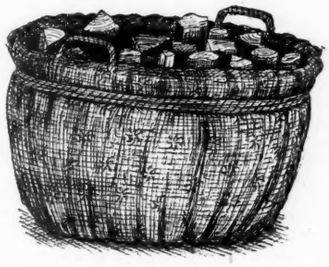
the corselet top, but the lining extends to the waist, and the skirt is tacked permanently to it. The corselet has an under waist-belt tacked to the seams, and spring-hooks fasten it to the skirt belt to keep it properly adjusted. The suspenders and straps for the collar, sleeves and skirt are all feather stitched with coarse knitting silk which matches the color of the waist; they all end in points, and are, seemingly, held in place by handsome flat buttons. Only two buttonholes are required, one at the neck and one at the end of the suspender, at the left side in front. A flat patch-pocket is sewed to the skirt lining beneath one of the side straps—which covers the pocket opening in the seam.

The costume is thus illustrated and described, because it proved so stylish and effective and might be so easily imitated, if not exactly copied, by those who have good materials to make over at home. Narrow passementerie would trim the straps prettily and passementerie ornaments with pendants might replace the buttons. Or the corselet and straps might be of velvet, the waist of silk, and the skirt of silk or wool goods.

Wood Basket for a Farmhouse Chamber.

JEWEL ALSTEAD.

The sketch shows a common farm basket covered with a long gathered strip of ordinary sacking, which has first received a powdering of small daisy-shaped figures worked in long stitch with green Germantown; each figure requires only seven or eight stitches, each stitch being about half an inch long. The upper edge of the cover is gathered and tacked inside the basket just below the top; then the lower edge is gathered in under the bottom, tacked to position and finished with a round bottom piece of the sacking which is tacked to the basket, through and through. A strip of green striped carpet binding is bound about the basket to confine the fullness, and the handles are



AN ORNAMENTAL WOOD BASKET.

covered with the same. Such a basket is handy when one has much wood to carry up stairs, and it saves all litter from dropping bits of wood and moss; it also saves unloading, for the basket looks quite as well to remain in the chamber as the old-time wood box, and will hold as much as many of them did. If necessary, when spring comes, and every basket on the place is called for, the covering may be removed in a very few moments; but an old basket, past service, if neatly repaired, will often do just as well as a better one.

How to Banish Roaches.

ALICE CHITTENDEN.

One who has always lived in the city is apt to consider roaches and water bugs as part and parcel of a city life, and to think it a part and parcel of their own life to have a daily hand-to-hand contest with them. I always looked upon country folk as peculiarly blest in being free from them, until I once took a country house a mile or more from a village, and found it peopled with a giant race of cockroaches. I succeeded in almost banishing them as I used to do the water bugs of the city, by perfect cleanliness and a free use of borax. I purchased this material by the half dozen pounds, and as it only cost eleven cents a pound, the process was not expensive. Every night after the kitchen was swept, it was sprinkled around the edges of the baseboards, the sink, the "pot-closet" and all their haunts. It was kept permanently on the shelves of the closets on which I allowed no paper, and when the cellar had its weekly cleaning, it was liberally sprinkled there. But by doing all this, I only almost, but not quite, drove them away. One day when cleaning the kitchen, of which the woodwork was oiled yellow pine my servant rubbed it all over with a cloth well oiled with kerosene. As we never saw a single specimen of the uncanny race after this, I must conclude that they have a constitutional antipathy to kerosene. We did not neglect to give the woodwork a fortnightly oiling.

A New Style of Wall Pocket.

L. RINGUEBERG.

This pretty and showy wall pocket is easily made, and the material costs about $1.25. The foundation is a Japanese rain hat, and can be procured at Japanese and fancy stores. It is bronzed in fire and gold bronze alternately on the ridges

SOMETHING NEW FOR A WALL POCKET.

or woven rows beginning with the fire bronze on the outer row. The ribbon and crocheted rings are all in copper color to match the fire bronze. The large bow requires one and three-fourths yards of ribbon; the narrow ribbon for lacing and loops requires four yards and there are two dozen crocheted rings. The pocket is made of pasteboard, covered with cream chamois skin and lined with dark red silesia. The chrysanthemum design is painted in water colors, the flowers a creamy brown shading into dark brown, the leaves a grey green. The flowers are outlined in fire bronze, and the leaves in green bronze. There are twelve rings sewed upon the pocket, and twelve opposite these on the foundation. Through these the narrow ribbon is laced, terminating in a fall of loops on the leftside. The pocket is then sewed firmly at the corners to the foundation. The large bow at the right side completes the pocket.

A Lace and Ribbon Collarette.

For this stylish collarette make a wide neckband of ribbon or silk and on it sew three frills of handsome lace-net edging, into which, at regular intervals, has previously been run short lengths of baby ribbon, as shown by the illustration. All

A NECK ORNAMENT.

of the ribbon ends, which hardly reach the edge of the lace, are neatly notched and fall on the outside. To each end of the neckband are sewed three long ends of the narrow ribbon (the sketch shows only half of their length) which are to be tied, taking the three as one, in a light, airy bow. The model was of thin black lace with white ribbon; another of black lace was lovely with ribbons of narrowest yellow velvet. White lace, with

ribbons of delicate tints, are pretty for misses, and are often tied at the side, the bows fluttering over the shoulder, front and back. A different shade of the same color in each frill, and the three shades together in the bow would be very pretty. For a gift, nothing wearable could be prettier, and to many, wearable gifts are more welcome than "useless pretty things."

Easter Costumes.

Varied and brilliant as the crocuses and tulips, popping up their blithe little heads in our flower beds, are the new spring colors; while it is almost enough to give a fashion student a brain fever to try to remember their names. For instance, there are the tender water shades of blue, like the reflection of the summer sky in a placid lake, that are called "Baltique," "Rhone," and "Cronstadt." A gay, bright yellow is dubbed "Chili," in remembrance, probably, of our late unpleasantness with that country, and a darker tint, verging upon brown, is known as Egyptian fellah. *Fer forgé*, or wrought iron, is the darkest of dark steel color; *biche* or hind, castor, *biscuit*, and blondine, the different shades of tan; while there are dozens of other odd titles for the greens, violets, and reds.

And what shall be chosen for the Easter gown? Ah, that depends altogether upon what use the suit is to be put to afterward. Some like to sing their carols in silk attire; others feel content with a fresh but simple wool frock, which will be the useful dress for all summer, while there are pretty costumes that come half way between the two, and that are, perhaps, the best selection, after all. She who still, throughout the long reign of wool, has cherished a lingering *penchant* for the rich, glossy weaves spun from the mulberry worm's winding-sheet, may now give rein to her fancy, and, if she desires the leading style, will buy one of the changeable twilled silks, that glint one hue in the light and another in the folds, with a tangle of vines wandering over it, or else besprinkled with tiny baskets of flowers and fluttering bow-knots, recalling the ornate French fashions of a century ago. These thin silks are made up on a foundation skirt, almost as dressy as the outside, with pinked ruffles and a balayeuse, the five breadths being sloped off twelve inches at the top of the back, and there massed in many small plaits, leaving the front and sides perfectly straight and smooth. The corsage is either a round-yoke waist, worn with a girdle, or else has a full coat skirt, gathered across the back from side to side. The sleeves are a long puff to the elbow, with close deep cuffs below, or a Marie Antoinette ruffle. The yoke and lower half of the sleeves are often covered with the *Point de Gênes* lace now so much in vogue, in both white and écru, but if black is preferred guipure can be substituted. Many of the light silks are also trimmed with ruche-like bands of black feathers, and are given expression by Watteau bows of black moiré ribbon.

Little Miss Practical's Easter suit will be one of the substantial though light-weight checks or homespuns, which will be just the thing for shopping and traveling later on; and the skirt will clear the ground, instead of assisting the street cleaners. And right here let me whisper that, according to the latest advices from abroad, a reaction is likely soon to set in from the troublesome demi-train on walking dresses. The skirts of these English wool gowns are much gored, and have piping folds of velvet, matching the darkest color in the material, and rows of very narrow gimp running up all the seams, while the bodice is double-breasted, with a postilion back, and a pointed front rolling open to reveal a vest of some contrasting shade.

The finer woolens, ribbed, silk-shot, or plain, spoken of last month, will form the half-dressy spring costumes, as the wide diagonals known as Vicuna cloth, the crépons, and the Bedford cords. The light colors in these are exquisite, and the black ones, for those out of mourning, are brightened by whole corsage fronts of gay-hued bengaline and much glittering jet. These gowns are also frequently trimmed with feather garnitures, and, the skirts being gored and lined throughout, they are worn over a silk petticoat, either black or matching the dress in tint. Indeed, handsome silk petticoats are quite a feature of the season, those designed for housewear being gay as the rainbow itself, for within doors they contrast with the robe in place of matching it. But think not every stylish girl is making a collection of these fine articles of apparel! She resorts to a clever little ruse, and inside the bottom of her nice dress skirts sews a deep, pinked ruffle of silk, like a balayeuse, which serves every purpose, and is much less expensive.

With the dainty Easter costumes are worn low, flat straw bonnets, with bell crowns, straight brims, and a tiny point in front, or else round hats of Milan split straw, chip being one of the fancy braids which are imported in vast quantities. There are also lovely jet-crowned *chapeaux*, with brims of lace or ribbon, while very many black straws are rather heavily trimmed, for balmy spring, with jet ornaments and ostrich feathers, especially an edging of tiny tips, set on to plaited *chiffon*. As usual, many hats will match the walking dress, but it is quite as fashionable to have one black or écru, to be used with a variety of gowns. Lace plays a prominent part in the season's millinery, and both satin and moiré ribbon is largely employed for loops, bows, rosettes, and strings to tie under the chin and fall low upon the bodice. A rather odd fancy is the use of white satin ribbon on dark *capotes*. Large hats will have both flat wreaths and high, quivering sprays of French flowers, violets, perhaps, being the favorite, particularly in combination with brown. Besides the dear little purple blossoms, there are beautiful aigrettes of yellow jonquils, pompons of daisies or pink heather, garlands of wild roses, clover, and sweet peas, and large single flowers, alone in their glory, while with one and all, is combined a mass of green foliage, grasses, ferns, and thorny stems.

Some Uses for Table Oilcloth.

VELMA CALDWELL MELVILLE.

Table oilcloth is coming to be one of the "indispensables" in modern housekeeping, and figures in uses both ornamental and practical. The shabbiest farm house may be quite transformed by its agency in the hands of an artistic woman; and it serves as well in the home of wealth.

To illustrate, I will describe some of its uses in my own home. Of course each chamber has its own color. The front one is in red, that being the prominent color in the carpet, the plain band in the paper bordering, the chair cushions, easel and mirror drapes and toilet accessories. The furniture and wood work is in oak color with red lines. As a complement to these we use green and autumn tints in coloring the oilcloth for splashers. Back of the commode is a piece pinked around the edges, and painted in representation of an autumn scene; gnarled tree trunks with foliage in crimson and gold in the background, a pool of water of a rather greenish tint with two barefoot children "splashing" in it in the foreground. The slopes are covered with yellowing grass. The commode cover is of the same material, pinked, and painted in plain oak, and bearing a bunch of red roses and green leaves in either front corner.

In the tiny bedroom across the hall, blue is the predominating color, and neatly tacked over the sober, nondescript carpet, and under the wash stand is a large square of oil cloth, painted for the foundation blue (in all cases white oil cloth is preferred to begin with, as it takes fewer coats of paint). In the corners are traced vines of morning glory with pink and white flowers. The splasher back of the stand corresponds, except that the vines almost entirely cover it.

The parlor is in hard finish of a pinkish tint on the walls and greenish overhead. The space under each window, to the base board, is filled in with oilcloth painted in summer landscape. The effect of this, with fleecy lace curtains draped back at either side, is very pleasing, as well as deceiving. Every one supposes the painting to be on the wall proper.

In the family living room, oil cloth, painted in tasteful designs, is used instead of rugs, and a strip edged and appropriately painted serves as tidy on the big rocking chair. By simply wiping off with a damp cloth one has a clean tidy. The cover for the table, round which the family gathers at evening, is of this same white oilcloth painted a delicate brown and ornamented with bunches of roses, red, white and yellow.

And now for the kitchen. Back of the work table is a great oblong piece bound in red braid and nearly covered with gayly colored tomatoes, radish, beets, peaches, grapes—in short, all the available fruit and vegetables from last year's catalogues. After the foundation was firmly tacked to the wall the pictures were pasted on; as soon as dry they received two coats of varnish, and there they are, proof against water, grease, or any other kitchen table agency. This material also makes excellent lambrequins for back kitchen windows, where flies are apt to prove ruinous to white ones; for pantry shelves, for kitchen aprons and for children's bibs.

The paint used on the ornamental pieces keeps the oil cloth from cracking, and they are very durable. This material serves admirably instead of real canvas for regular oil paintings, and is handy in case one wants to send a specimen of their artistic skill to some friend at a distance.

Lenten Dishes from Eggs.

ALICE CHITTENDEN.

Creamed Eggs.—Melt a tablespoonful of butter in a frying pan, and stir in a heaping tablespoonful of flour; when smooth, stir in slowly a pint of hot, rich milk, or half milk and half cream, season with salt and pepper, and pour over nicely-poached eggs] laid on rounds of buttered toast. Another way is to add minced parsley to the cream sauce and pour all over hard-boiled eggs that have been sliced.

Shirred Eggs.—Butter an earthen pie dish, and break into it as many eggs as required. It will be well to adapt the dish to the number of eggs you are going to use as they should lie closely, but without crowding. Drop a bit of butter and shake a little pepper and salt on each and place in the oven until the whites are set. The dish should be hot before it goes in the oven, and two minutes cooking will generally suffice, as the heat of the dish cooks them a little more after they are removed to the table. Cooked in this way, they are far more digestible, and, therefore, preferable to fried eggs which, through improper cooking, are so often served tough or scorched, crisp and horny. There are little individual shirred egg dishes with covers and short handles which are most convenient and furnish a pretty addition to a breakfast table. Keep the covers hot and put them on after the eggs are taken from the oven.

A Supper Dish.—Beat six eggs and add a tablespoonful of minced young onions and one of parsley, two ounces of melted butter, two of grated cheese and salt and pepper to taste. Melt a little butter in a frying pan, turn in the mixture and fry lightly, stirring meanwhile. Take from the fire while rather soft.

Eggs with Gravy.—Pour a gill of brown gravy from beef, mutton, veal or chicken into a shallow pie dish; set in the oven or on top of the stove until it boils, when break into it as many eggs as will lie closely together; season, sprinkle with fine bread crumbs and place in the oven until the eggs are set. Have ready as many pieces of toast as you have eggs, lift an egg carefully upon each and pour the gravy equally over. A gill of gravy will be sufficient for six eggs.

Eggs Fondue.—Beat six eggs until light, add salt and a dash of cayenne and two heaping tablespoonful of grated cheese, (Parmesan is best, but any hard, rich cheese may be used); put a tablespoonful of butter in a frying pan, and when hot turn in the eggs; stir until smooth and sufficiently cooked. Serve on bits of buttered toast.

Economical Omelets.—Many delicious and economical omelets can be made by the addition of cold fish or minced and cooked vegetables. Take a cupful of any cold fish, preferably some salt fish, although fresh fish can be palatably seasoned and used, free it from bones and heat in a white sauce made from half a pint of milk and a tablespoonful each of butter and flour; break into this three eggs and stir until they are properly cooked. Serve all on toast. Another way of combining eggs and fish is to spread the fish heated in the sauce on a buttered dish that has been well sprinkled with fine breaderumbs, break on top an egg for each person and set in the oven until the whites are set.

Rice Omelet.—Mix a cupful of cold boiled rice with one of milk and four beaten eggs; pour into a hot pan containing a tablespoonful of butter and cook in the oven until done. This is a favorite dish at the South.

Bread Omelet.—Soak stale bread in hot milk and mash it well; add three beaten eggs, and cook like an omelet, using salt pork drippings instead of butter for frying.

BOYS & GIRLS

Wolfie's 'doption.

H. S. CLARK.

It had not seemed as if anything could make that narrow, squalid street look any more dismal than the pouring rain, but, when late in the afternoon, the rain stopped and the sun struggled to break through the gray clouds, a pallid light fell over the tall rows of tenement houses that made their squalor even more apparent.

A few women with shawls hastily thrown over their heads hurried along the street, their wet skirts flapping about their feet. It was not yet five o'clock, and the men who were on the street straggled aimlessly along with that weary, out-of-work expression with which one soon grows sadly familiar in certain parts of the large cities. The street, however, swarmed with children who hopped about like sparrows and picked up their crumbs of enjoyment much after the manner of the feathered tribe. A street band played "Little Annie Rooney" with much vigor and many discords, and some of the children danced to the music, evading the heaps of rubbish with surprising grace and agility. Into this kaleidoscope of dingy colors a new figure made its appearance.

"Hi there, Wolfie!" shouted a small urchin, refraining for a moment from storming the windows of a tenement house with mud balls.

"Hi there, yerself," responded the newcomer.

"How's Joey?" asked the urchin.

"Joey's bad, to-day," was the answer.

The first urchin resumed his interrupted occupation and the other moved along. One shoulder appeared to be considerably in advance of its neighbor and he proceeded side foremost, somewhat after the manner of a disabled crab. As straight as the manner of his locomotion would permit, he came up the steps of my house and jerked the door bell.

"Good afternoon" I said, hastening to open the door, "do you wish to see me?"

"Be you the doctor lady?" inquired my visitor, scrutinizing my face for some stamp of the profession.

"Yes," I answered, smiling, "what can I do for you?"

"Nothin' for me," he replied, with a scornful gesture of an uncommonly grimy little paw, "only just Joey."

"And who is Joey?" I asked.

"Joey? He's my 'doption," was the answer.

"Indeed!" I said, "and what might your name be?"

"It might be George Washington, but it aint," he replied crisply, but, relenting, added, "My name's Wilfred Mercer, Wolfie they calls me in the street, and you can call me Wolfie, too."

"Well, Wolfie, what is the matter with Joey?"

"Oh Joey's back is bad, he jest cries and hollers all the time; I brung him a bernanner this noon that was most all good and he wouldn't even look at it, and Joey likes bernanners powerful well," he added reflectively.

"I will go with you at once," I said, and we were soon threading our somewhat devious way among the puddles of water that lay in the hollows of the sidewalk.

"How old are you, Wolfie?" I asked as we turned down the neighboring side street.

"P'raps ten, p'raps twenty," he answered musingly, "I'm the kind that don't grow, yer know, and yer kin't tell on folks like me how old we is anyhow."

"But you know yourself, don't you?" I persisted.

"Well, p'raps I do. I dunno, though, it's a goodish while since I rec'lect havin' of a birthday."

His face looked so weird beneath his brimless hat that I felt that he might, indeed, be "any age" and changed the subject.

"How do you get your living?" I ventured next.

"I'm a newsboy, leastways I was, but the cops won't let me sell papers now cos a sassiety said as how I warn't fit and my father he'd hev to take care of me, but lor,"—a mirthless smile spreading over his face,—"my father ain't no account. He pays the rent tho' quite reg'lar and sometimes I I gets five cents off him, but he ain't been 'round very recent, and I reckon he 's got took up."

"How do you live, then?" I asked.

"Oh, the butcher lady, she's a friend of my father's and she gives me soup 'most every day for me 'n Joey and now and then I gets a sandwich off the saloon men, besides—there ain't no cops 'round, is there," he broke off peering sharply around—"it's 'gainst the law to peddele," he continued, seeing that the brass buttons of the law were not in sight, "and I might get took up if the cops knew it, but I don't mind telling yer that I sells combs. I carries 'em under my coat and nobody knows it and, then if a cop comes, I jest scatter, see?"

"Do you sell many?" I inquired.

"Well, no, not such a heap, but suthins better nor nothin'," he said cheerfully.

It occurred to me that the sparrows in the street had a somewhat less precarious means of subsistence, but by this time we had reached the rear tenement where Wolfie and his "'doption" lived and there was not time for further inquiries.

"Watch out there!" he exclaimed as I groped my way in the darkness "that there ninth stair's broken and yer'll hev to climb over it."

I counted eight stairs, climbed over the ninth, and with eyes now more accustomed to the darkness, I followed Wolfie, who was sidling up the stairway some distance in advance.

Two, three, four flights. At last we were at the top of the house where Wolfie and his 'doption lived, and Wolfie drawing himself up with an air of dignity, announced "This is where I live. See?"

I looked and I "saw" a miserable, dirty room, a chair, a wooden stool, a stove so tiny that it seemed as if a strong draft of air would blow it up the chimney, a table; and, in one corner of the room, a bed.

"'Sthat you, Wolfie?" came in a sharp, childish treble from the corner.

"Yes, Joey, it 's me and I've brung the doctor lady to make yer back well."

On the bed lay a poor little emaciated form with a mass of tumbled, curly hair thrown back on the pillow and big black eyes that looked bigger and blacker from the purple shadows under them.

"My back won't never be well," said the child, turning his head wearily on the pillow, "but it don't ache so bad now nor it did."

"Let me see," I said passing my hand over the pathetically thin little back.

"How did it happen?" I asked of Wolfie, who, perched on the stool, was regarding me with a look of elfish intelligence.

"Yer see his mother was drunk 'nd she pushed him down stairs 'nd that's how it happened. I got pushed down stairs myself oncet. It didn't make so much difference on me 'cos I'm tough but I kinder felt for Joey, and that 's why I 'dopted him,—see?"

"Where is his mother, now?" I asked.

Wolfie jerked his thumb outward with an expressive nod that probably would have conveyed information to the initiated but which left me as much in the dark as to her whereabouts as before.

"Joey ain't goin' to die, is he?" he asked in an eager whisper drawing me over by the window.

"Oh no, I hope he isn't," I replied as encouragingly as I could.

"Be you talkin' about me?" sounded in Joey's shrill voice from the corner.

"I was showing of the doctor lady yer garding," said Wolfie recovering his *sang froid*.

"This yere, yer see, is a g'ranium," raising his voice that Joey might hear him, "and that yere is what folks call heartsease, leastways 'twas afore the top got broke off" he corrected, pointing to a headless and withered stalk in a broken flowerpot.

"Joey he sets a heap of store by his garding and it does look purty with the sun a shinin' on it."

I mentally wondered how the sun could manage to shine through those dirty window panes, but Wolfie went on pleasantly, "Bein' a rear tenement we has a heap of sun 'nd that 's savin' on coal as well as bein' better for the health."

"How would you like to have Joey go away for a few weeks, Wolfie?" I asked tentatively.

"Yer ain't goin' to take Joey away from me, is

ON THE BED LAY A POOR LITTLE FORM.

yer?" said Wolfie, his eyes dilating with apprehension.

"No, no, not for long," I assured him "only for a few weeks where he will have a clean, soft bed and plenty of good food, and maybe get strong and well."

"And me not see him?" asked Wolfie, piteously.

"You shall come to the hospital every week and see him," I promised.

"Kin I, certain sure? But hospitals is where they cut folks up and sell 'em, ain't it?" he asked, suspiciously.

"Oh no, indeed, hospitals are where they try to make sick people well and they would take the very best care in the world of Joey."

"Well, I s'pose he kin go," he said, reflectively; "but it'll be mighty lonesome 'thout yer, Joey," rubbing his ragged sleeve across his eyes.

"I ain't like other kids, yer know; I s'pose it's on account of my havin' of a crooked back and a lame leg. The boys they kinder jibe me 'nd I jibe 'em back; 'nd Joey's he's all I hev to be fond of. Yer likes me, too, don't yer, Joey?" he said, burying his head beside Joey's wan little face.

"You bet!" responded Joey with cordial affection and, after leaving a sleeping draught for Joey, I went away leaving them curled up together like two kittens on the hard, straw bed.

A few days later, Joey was snugly ensconsed in a clean, little bed at the children's hospital. The comfort and cleanliness of it all was a great surprise to him and it was some time before he became accustomed to it.

"My, if Wolfie were here!" he would say, passing his hand over the snowy coverlet with pleased wonder. But the pain in his back would soon make him forget even Wolfie and the clean coverlet.

Every day Wolfie came to inquire for Joey. When it was known that Joey was Wolfie's "'doption" he was allowed to come into the ward whenever he came, for it was only a question of time, and a very short time that Joey would stay. In spite of all that care and skill could do the pain in the poor little back grew worse and worse, and Joey's strength grew less and less able to bear it.

But his face never failed to brighten when Wolfie came, and Wolfie would sit for hours by the bed stroking Joey's fingers and talking to him in a crooning voice. Sometimes Joey would fall asleep and feel easier when he woke, and then he was content to lie and watch the golden sunlight that danced on the white walls of the hospital ward and he would put out his hand to catch the sunbeams that flickered over the coverlet, but they always managed to slip through his fingers and Joey thought that it was because his hands were so small and weak, and he would smile and say that he would chase them and catch them when his back was well again.

But one morning when the air was sweet with the prophecy of coming spring, Joey's spirit slipped away from the suffering little body and when Wolfie came Joey had gone where there was no more cold, or hunger, or pain. They thought that there would be an outburst of grief when they told Wolfie but he only drew his hand across his eyes as if the sunlight dazzled him and without a word he turned and went away, nor could they call him back.

For several days at this time I was out of town and the first inquiry that I made on my return was for Wolfie. No one at the house had seen him and I was just thinking of looking him up when I saw the child edging his way up the steps. In his arms he carried the flowerpot with the scrubby "g'ranium" of Joey's "garding," and from one of his sleeves there drooped a scrap of black crape.

"I've brung yer this yere, cos he set store by it, and yer was good to him," he said as I opened the door. "He won't want it no more," he said, carefully setting the pot on a chair in the hallway. His face and hands were indescribably dirty. He rubbed off some of the soil from his hands upon his trousers.

"Guess if you had a lame back and a bad leg you wouldn't go up four flights of stairs to wash 'em," he said, apologetically, "besides *he* ain't there now."

The last link that bound the little waif to love seemed severed by Joey's death. Something in his isolation touched me inexpressibly and I said impulsively, "Wolfie how would you like to stay here with me?"

"What? yer don't mean it!" he said, a sudden ray lighting up his face.

"Yes, I do mean it. I want a boy who will black my shoes and do my errands," resolving on the spot to throw away my French dressing and buy a shoe brush and blacking, "and you, Wolfie, are the boy I want."

"Oh lor!" he exclaimed, too surprised to collect himself. The tears were running down his cheeks, streaking little channels through the grime of his face.

"There ain't nobody speaked kind to me since *he* died and I ain't had nobody to do nothin' for," he sobbed, and I did not try to comfort him for I I thought that tears would be the best relief to his burdened little heart.

"Yer sure yer mean it?" he asked, doubtfully, when he had recovered himself.

"Indeed I do," I answered.

"Shake" he said, extending his hand.

If he had been just a little cleaner I think that I should have kissed him to seal the bargain, but dirt is a great represser of sentimentality and I not only did not kiss him but I did not prolong the ceremony of hand-shaking beyond necessary limits.

"Would you like to go home for anything?" I asked when we had talked over the new arrangement.

"'Taint home now Joey's gone; and my clothes is mostly at the Chinee laundry," he added, with dignity.

"Oh, of course, if your clothes are at the Chinese laundry you won't need to go home," I said, as politely as I could, "and when you have had a bath you will let me give you some others; clothes will be part of your wages."

He was so grimy, so very grimy, that it did not seem as if any ordinary cleansing process would have much effect, and, after some consideration, I took him to a Turkish-bath establishment, whence he emerged, some hours later, in an unrecognizable state of cleanliness. New clothes throughout completed the transformation, and no butterfly, newly emerged from the chrysalis, could have found the metamorphosis more delightful.

"Do yer s'pose Joey has clothes like these yere in heaving?" he asked, after contemplating his attire, for some time, in silence.

"Joey has all that his heart can wish," I answered, gently, and with that answer Wolfie was content.

"I s'pose I kin't use bad words no more if I'm going to be your boy, kin I?" he asked, when the novelty of the new clothes had worn off a little.

"Certainly not," I replied, "and Joey would be sorry to have have you use bad words, too."

He got along bravely through the day, but the next morning I found him with his fingers pressed tightly over his mouth.

"Oh my! oh lor," he exclaimed, "I shall just *bust* if I don't say bad words now and then. Do yer s'pose Joey 'd mind if I should just ease off kinder gradooal instead of stoppin' so suddint like?"

Wolfie's progress was indeed "gradooal," and his relapses were at first alarmingly frequent, but in due time persistent care and kindness brought their reward. The stunted little form began to fill out and increase in stature, and though the crookedness must always remain one forgot it when one glanced at the sensitive face, whose shrewdness was fast giving place to a bright intelligence.

Lame dogs were very near his heart, and the house was in danger of being converted into an asylum for battered canines, for Wolfie pleaded so hard for his four-footed friends that I had not the heart to forbid his bringing them in, and he experimented on them with splints and bandages to his heart's content.

"Seem's if they was sorter human like," he explained one day when he looked up and saw me watching him. And indeed he had a dexterity and skill of manipulation that was not thrown away on me.

The days grew into months and Wolfie staid on, making himself useful in such a variety of ways that I wondered what I had done before he came.

One morning an idea occurred to me, and I said, rather abruptly, "Wilfrid, how would you like to be a doctor?"

"Golly!" he exclaimed, surprised into a lapse of language. "I mean—that is—what do yer say, Miss Annie?"

"I mean that I am going to have you educated," I said, decidedly, "and it rests with yourself what you will be."

Wolfie was silent for a moment, and when he looked up, the tears were streaming down his face.

"I'll try to be a credit to yer," he said, earnestly, "to yer and to Joey."

And the weeks go whisking into months, and the months go spinning into years, and who knows what the future will bring forth?

A California Wild Goose Chase.

MYRON B. GIBSON.

The California boy can hardly understand the peculiar significance commonly attached to the phrase "a wild goose chase." To him, a goose hunt means a day's shooting on the tules and with any luck at all more game at night than he can carry home on his back. The numerous flocks of geese, flying and squawking in all directions, made me impatient to get at them with my Parker the first day of my stay at my friend's ranch. But when I spoke of it he suggested that I wait until the first foggy or windy day, when the birds would fly lower. "Then," said he, "we will take a team and go out on the tules and have some shooting that is shooting." The day came before long, and loading guns, ammunition, provisions and a camping outfit into the big box of a header wagon, already half-filled with barley hay for the mules and for our beds, the rancher, myself, one of the hired men and two lads in their teens, sons of my host, climbed aboard and struck out for the tules or marsh lands adjacent to the Sacramento river.

It was late in December; the rains had set in early that winter and all the fields were green with growing grain. The north wind blew a gale, but the sun shone bright and the air was soft and balmy, more like May than December to me, just out from Minnesota. A ride of three hours brought us to the bank of a small creek fringed with oak timber. All around us stretched low, level lands dotted with patches of tall tules,—bullrushes we call them in the East,—and numerous shallow ponds and sloughs. Many of the streams of California, throughout their lower courses, flow between banks several feet higher than the surrounding lands. This is caused by the floating down of debris or "slickens" from the hydraulic mines in the mountains, which forms deposits sometimes many feet in depth and extending miles back from the channel. The streams all begin to rise with the first rains early in the winter, and, breaking through the banks, back water among the tall reeds and tules, forming the finest feeding grounds I ever saw for all kinds of water fowl, with which they are alive from October to April.

Tying the mules to the wagon-box we cut poles, pitched our tent and fixed up our camp before firing a gun, although flocks of birds kept skimming over our heads, barely higher than the tree-tops, and filling the air with their squawking. The camp in order, we donned our gum boots and, with the sun an hour high, started out for an evening shoot; my host and I going in one direction, the hired man and the boys in another. Selecting points where the flight seemed thickest, we squatted in dense bunches of tules and commenced banging away. I thought I had seen pretty good flights of water fowl among the Minnesota lakes, but I had never before enjoyed such sport as this. Our greatest trouble was not in finding something to shoot, but in retrieving the great birds that came flopping down in the water on all sides of us. Ten minutes after sunset we stopped shooting, lest the flash of our guns should spoil our next day's sport. Then came the lugging of game into camp. All kinds of water fowl had been flying, but I had shot nothing but "honkers" and "speckle breasts," and had sixteen of them at my feet. My host, who had devoted his attention to spoonbills and mallards, had bagged twenty-one birds. We had goose fried between slices of bacon for supper, with bread, butter and coffee, and after an hour spent in smoking and spinning hunting yarns, we rolled up in our blankets and tried to sleep. But for my part the incessant quacking of ducks and the shrill squawk of geese rang in my ears all night long and kept me awake most of the time.

We breakfasted early and were at our stands before sunrise the next morning. The wind blew as strong as ever, keeping the birds close to the ground in their flight, and we had better shooting, if possible, than the night before. The geese flew thickest about nine or ten o'clock, when hundreds of flocks came in from the grain fields for many miles around, to drink and bathe, and rest during

the middle of the day upon the shallow ponds. They would not light here and there upon the first water they came to, but hovered about in large flocks until some bold gander flopped down into a pond, when every goose within sight or hearing immediately steered for the same spot. Unless disturbed, in course of an hour there would be enough geese in that pond to cover acres of water, and as they came circling down from a great height, they looked like a cloud of great leaves carried downward instead of upward by a monstrous whirlwind. Two-thirds of them were white geese and not worth shooting, but there were enough gray geese, brant and ducks to keep us very busy cramming shells into our guns while the morning flight lasted. The hired man and the boys brought in their share of game, and when we started home that afternoon, we had over a hundred birds in the wagon. The boys were not very good wing shots but managed to hold up their end by sneaking up to a small pond surrounded by thick willows, where the geese were lighting by the hundred, and making a great pot-shot; their four barrels, two on the water and two as the birds rose, killing no less than nineteen geese and brant.

It may seem incredible to those who have never visited California, but wild geese are so numerous in the great grain-growing sections of the State, that, if the large ranches did not employ men to "herd" them off the fields, acres of grain would be pulled up by the roots in a single moonlight night. These goose-herders carry long-range rifles and ride about on horseback firing upon and putting to flight the flocks as they begin to light upon the fields. Just after a long spell of north wind, when they can be shot so readily, the San Francisco market is so flooded with geese that pot-hunters often receive barely enough for their consignments to pay express charges and commissions.

The Bluebird and the Wood-Thrush.

ALFRED H. PETERS.

I have never been able to make the choice of my favorite bird, between the bluebird and the wood-thrush. The wood-thrush surpasses all of our other birds in gracefulness of figure as well as in quality of song—one of the sweetest strains upon earth. His plumage also is a rare combination of neutral colors, and his bearing, while reserved, is at the same time affable and gracious, provided he be not unduly disturbed. He is a model of fineness and delicacy among birds, whether you regard his song, his carriage or his color. He stops with us only about four months of the year, during the last two of which his voice, excepting a sharp click of alarm, is for the most part silent. Like the other insect-feeders, his sojourn in Northern latitudes ends before the coming of frost. Like the thresher, the bobolink and most of the other rarer songsters, he is an early summer bird.

The bluebird's song is a low warble, and when upon the wing at migrating times, a single note—a note of unspeakable cheer — the first bird-voice heard in the spring, and the last one heard in the fall; the same note in both seasons, often coming, as it were, from out the sky, as the bird unseen wings his flight high in air. The bluebird is a hardy and virile bird, though gentle and social withal, of simple and unaffected demeanor, like a gallant blue-coated sailor, home from a long cruise. He is the bird of Indian summer, no less than of early spring. We hear him and think of him most during his times of passage, yet he is with us from the reddening of the swamp-maple to the blossoming of the witch-hazel—as much time as he can possibly get in between the going and coming of winter.

The habits of both these birds in one respect, according to my observation, appear to have undergone a decided change. In my boyhood the bluebird was largely a domestic bird, nesting often in the cavities of decayed fruit trees and in bird-cots around country villages after the manner of wrens and martins. At the same time the wood-thrush was known to me only as a wood bird, seldom or never seen about human habitations, except, it might be, retired ones in the vicinity of timber or coppice. But of late years the bluebird has betaken himself to places less frequented. To see or to hear him, except during his times of passage, one must now go to the more distant orchards and uplands. On the other hand, the wood-thrushes sing all through June, among the trees of the market town, which is now my home, it being no exaggeration to say that they are next in number to the robins. The departure of the bluebird from his former haunts has been attributed to the presence of the English sparrow. The wood-thrush, undoubtedly, seeks the society of man for the protection thereby obtained against owls, squirrels and other woodland enemies. To find this fair habitant of the woods in the midst of a city was to me at first as great a surprise as it was a delight, and were my own city the only one thus favored, I should regard it as possessing a very superior attraction as a place of residence.

A Great Puzzle Repeated.

ONE HUNDRED AND SEVENTY-FIVE DOLLARS' WORTH OF PRIZES.

First Prize.—A splendid safety bicycle, one of the best standard makes, cushion tire, all improvements, **Price $135.00.**

Other Prizes.—2. A World typewriter, $8; 3. American telescope, $3; 4, Florence plush toilet set, $2; 5, a gentleman's shaving set, $2; and twenty-five more prizes, worth $1 each.

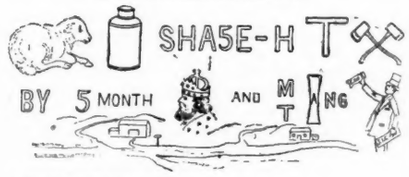
This offer was made in the January number, and the time for answering the puzzles was limited to February 1st. This time proved too short, and we have had so many complaints about it that we have decided to republish them, and give a longer time in which to work them out. The prizes will be awarded for the most perfect lists of answers received in this office before nine o'clock, on the morning of May 15, 1892. If there should be more than one perfect list, the first prize will be awarded to the one which presents the neatest appearance in every respect. Mistakes in spelling will be counted as errors, and, in considering tied lists, special attention will be paid to the arrangement and writing of the same. No two answers will be allowed to the same puzzle; that is, contestants must not say the answer is this *or* that, as answers of that kind will be thrown out entirely, even though one of them might be right. Contestants may get help from any one they please on the puzzles, but no two lists will be received from the same family. All who have already sent in lists will have the privilege of sending in revised lists, or they may let those stand as their answers. If you send another list, say it is to take the place of the one already sent. All letters for this contest must be addressed to the Puzzle Editor, AMERICAN AGRICULTURIST, 52-54 Lafayette Place, New York.

1.—ANAGRAM.

A truth for farmers:

Woods I guy, I do not sigh
Alone for unfledged bliss;
Oak oar grasp I, love water,
Try win this.

2.—ILLUSTRATED REBUS.



A fact for farmers.

3.—CHARADE.

My first has slain thousands.
My second lighted millions.
And my whole is the best of my last, which you all hope to get.

4.—ENIGMATICAL ACROSTIC.

The letters are represented either by numbers or the letter X.

1 X X 19 10
2 X X X X X X 11
3 X X X 12
4 X X X X X X 13
5 X X X X X X X 14
6 X X X X X X 15
7 X X X X X X X X 16
8 X X X X X X X X X 17
9 X X 20 18.

From 1 to 10 is a kind of fowl.
From 2 to 11 is a sacrifice.
From 3 to 12 is a fine fruit.
From 4 to 13 is a fragrant plant.
From 5 to 14 is a substitute.
From 6 to 15 is a favorable opportunity.
From 7 to 16 is a preservative against contagious diseases.
From 8 to 17 is contention.
From 9 to 18 is discernment.
From 1 to 9 and from 19 to 20 is a fact that farmers should know.

5.—COMPARATIVES.

To depart, blood; an animal, an entrance; part of a fish, to shout; help, a girl's name; a winter product, a product of night; an animal, to quail. Take one letter from each word and find what we are wishing for.

Example.—A stain, comparative terrible; answer, dye, dire.

CHAT.

The answers to the Seventy Noted Americans Puzzle will be given in the May number at which time the prize awards will also be announced, and we will publish a complete list of those who have sent in perfect answers.

C. M. W., Ills.: We only answer questions in the chat which will interest all puzzle contestants. If you desire any special information it will be given by the "Puzzle Editor," if a stamp is enclosed for the answer.

I. M., Col.: The Puzzle Solver will be sent to any address, on receipt of ten cents, by the "Puzzle Editor."

W. N., N. Y.: Questions for the "Puzzle Editor" must be written on a separate sheet from the list of answers.

Roy's Egg Thief.

CLARISSA POTTER.

Roy has the care of the hens. He gives them plenty of fresh food and water, keeps their house and nest boxes clean, and in the winter months, when the snow covers the ground, he sees that his hens have plenty of gravel and lime and cracked bone. Their dusting bins he keeps filled with road dust and dry ashes. Every night Roy writes in his "hen diary" how many eggs he has gathered that day and how many he has sold. When a brood of chickens hatch, he makes a note of it in this diary. Roy's mamma pays him two cents a dozen for all the eggs that he gathers; half price for cracked ones, and frozen ones not to be counted. He gives his hens such good care, that two cents a dozen counts up fast.

Last winter, when eggs were worth three cents each, and Roy kept a close watch that none should freeze, he found somebody was stealing his eggs. He would discover his laying hens on their nests, but, when they were off, no eggs were to be found. Roy's mamma thought a weazel or a skunk stole the eggs, so she told him to hide himself in the hen pen and watch.

The next forenoon Roy carried into the henhouse an empty sugar barrel with little lookout holes cut in it. He hid himself in the barrel, pulled a board over its top and watched the nest boxes in which were laying hens. By and by a hen flew off with loud cackles. Roy knew a nice, fresh egg was in the nest. He sharply watched for a sneaking skunk or a slinking weazel, but none came. Roy soon noticed that Mottle-wings was picking her way toward the empty nest. She didn't go straight to the nest, but pecked at this and that along the floor.

"She acted as sly and meeching-like as the thief she is," Roy afterwards told his mamma, "tipping up her head and looking right and left, to make sure no one was there to see her. Then she hopped into the nest, picked a hole in the shell and gobbled down that egg in a hurry."

Roy watched Mottle-wings until he had seen her hop into two more nests where eggs had just been laid and eat them. He now knew who was the egg thief.

Grandpa said: "Make a chicken pie of her; nothing else will cure her;" but Roy's mamma said: "Let us try a dose of pepper."

She pricked a hole in each end of an egg and blew out its inside. Then she filled the shell with equal parts of corn meal and cayenne pepper and pasted bits of cloth over the holes. Roy put the egg where Mottle-wings would be sure to find it.

She was so eager to steal it, she filled her crop and throat and eyes with pepper before she knew it was not a nice egg to eat.

Mottle-wings sneezed and choked and clawed and whirled about like a crazy hen. She never forgot how that pepper smarted, and afterwards was always glad to let the eggs alone.

Southwestern Kansas.

Last year was a very bountiful and successful one to Kansas farmers, yet there are few, if any of us, who cannot look back and see where and how better results could have been obtained by better management. I believe with the AMERICAN AGRICULTURIST that we may learn many lessons from our mistakes. Among the most serious items of loss is the neglect of costly farm implements and machinery. Not less than four-fifths of the headers and binders used in harvesting the crops in this county, last year, are now standing out of doors. Besides, there are plows, harrows, drills, cultivators and mowers still lying where they were last used. The sun and drying winds of our climate are very hard on machinery.

Many of us attempted too much last year, and got behind with our work. The autumn rains caught a great deal of wheat in the shock, where some of it bleached and some sprouted. Now, instead of grading No. 2 or No. 3, it is No. 4, or "rejected." That means a loss of ten to twenty cents a bushel. Wheat sown in September covered the ground in December with a thick, green mat, affording excellent pasturage, which was in ready demand at a dollar an acre per month. Three-fourths of our farmers lost this, by seeding in November. Several of my neighbors came to me last fall and bought hogs to slaughter for their own consumption. Every one of them had thrown away house slops, melons and damaged grain enough to have fattened their own meat. Among our cows are many barren and others which are hard to winter, and we resolved to sell them. But in July, when they were fat, we neglected it, and so we are carrying them through another winter—feeding them at an actual loss of the food, plus the interest on the money they would have sold for in summer. These are a few of the items of loss which eat up the profits—"the little foxes that spoil the vines."

W. V. JACKSON, Comanche Co., Kans.

Cheap Living in Brazil.

There is no other country in the tropics where life can be sustained with as little effort as in Brazil. If ten acres are enough in the temperate zone, one more than suffices here. Any negro with a bamboo cabin thatched with palm leafs can scratch with a hoe a small patch behind his clump of bananas and raise a crop of mandioca or manioc which will keep his family alive. This is a crop which can be produced abundantly and without cultivation on the poorest soil. It supplies the chief food of the natives. Three acres will produce 20,000 pounds of tapioca, worth at least $600. Half an acre, with the most indifferent cultivation, will feed the largest family. If a few banana trees and a mango are back of the cabin and a corner is reserved for pineapples and another for black beans, even a quarter acre will suffice for feeding the family, with frequent renewals of the mandioca crop. Then the negro can have a small herd of goats grazing on the roadside at all hours, and their skins, when shipped to a foreign market, will yield him a store of spending money for cigarettes and strong drink on feast days. In countries like Brazil, which are tenanted by thousands of poor and indolent families, mandioca and goats answer the requirements for prolonging life indefinitely. Sometimes the cultivation of the mandioca is dispensed with as too laborious! The negro, if he have a few goats grazing among the rocks on the seashore, is contented and knows that he can keep the wolf from the door without labor.

N. ORDI, Bahia, Brazil.

Making the Desert Bloom.

Many years ago when the great West was an unknown region, a barren waste inhabited by wild tribes of Indians, a large party of Mormons penetrated its depths in order to find a place in which to build up their peculiar religion free from all persecution. In their journeys they came to the great Salt Lake. It is wonderful that they had the perseverance to settle there and try to make a home. Nothing but religious enthusiasm and wise leadership can account for their choice.

They found a broad valley in the mountains filled with a great lake of salt water utterly unfit for any use. The area of the lake was 2,000 square miles, but the effects of its waters extend far on all sides, producing salt marshes and alkaline plains. All around the lake, to the very mountain base, extended a barren plateau nearly 7,500 feet above sea level. The rainfall of the region was utterly unequal to raise any form of vegetation except the scanty and hardy vegetation of the plateau. There they settled and began to build a city which is now the prettiest city west of the Mississippi, and to make farms which have transformed this once barren desert into the garden spot of the continent. They did this miracle by means of irrigation, using for their water supply a fresh water stream which empties into the lake from the high mountains of the neighborhood.

Of recent years the Mormons have attracted much attention, and their home on the great Salt Lake has become noted. The development of their farms is an example of what can be done in many similar regions of the West by combined labor, thrift, and wisdom. Small capital is needed, the main necessity being intelligent coöperation. There is a great field in the future for similar combined efforts.

T. ROSS, Salt Lake City, Utah.

Montana Field Crops.

Hay is one of Montana's most important natural products, and stockmen cut as much as a thousand tons each in some localities last season, all of an excellent quality. Wheat growing, until recently, has received little attention, and most of the grain was of poor quality, but with the introduction of Scotch fife a grain has been marketed that could scarcely be excelled, a flour being made from it fully equal to the best shipped in from Minneapolis and other famous milling centers. The yield of 1891 varied from 35 to 60 bushels per acre, according to locality, and much of the grain ranked as "No. 1 Hard." Oats have always been a favorite and leading crop. They yielded all the way from 40 up to 100 bushels per acre last year. One grower claimed to have obtained 129 bushels per acre on a small field. White Russian oats are almost the only variety grown, being plump and heavy and well adapted to our climate. Considerable sweet corn of the taller varieties was grown last year, but usually the dwarf Minnesota corn, alone, matures early enough to be of any value. Squashes, and tomatoes also, turned out well in favorable situations, but the season is rather too short for any of these to develop to their best with certainty. Potatoes, like other crops here, are rarely treated to any kind of fertilizer, chemical or barnyard, yet they yield from 200 to 400 bushels per acre, and frequently good, solid specimens, weighing from two to three pounds each, are brought to market in considerable quantities. The favorite varieties are Early Rose, White Star and Burbank Seedling. Beets have never been grown to great extent, there being little demand for them. They do well in rather sandy loam, even in a comparatively dry season, and attain to a good size. One specimen of sugar beet exhibited recently weighed 24 pounds. The cabbage and cauliflower, when receiving sufficient moisture, are wonderfully adapted to our soil and climate. The finest quality of cabbage is being brought to market in such abundance that it can scarcely be disposed of at any price. Many fine specimens, perfect in every respect, and weighing from 15 to 25 pounds, have been grown without fertilizers. The Drumhead varieties are well liked, and are probably grown more than any others.

ROBERT S. WILLIAMS, Cascade Co., Montana.

Charming Fresno County.

While the raisin industry may be called the king of the horticultural field of Fresno county, all kinds of citrons and other fruits, berries, melons, pumpkins, vegetables, everlasting meads of verdant alfalfa and broad fields of golden wheat are produced here. Fresno county has an irrigation system well inaugurated, but the water is only used for the vines, fruit trees and alfalfa. A large area of the valley portion of the county has become subirrigated, or, in other words, the surface water which has been run over the land for a number of years, has settled and filled the whole subterranean strata. In many places the fruit trees and grapevines have been killed by their rootlets being submerged in water, and there are many nice meres which have filled low depressions simply from the filling up from below. The water is derived from the Sierra Nevada Mountain which joins us and lies just at our east, and looms up as a grand sentinel with a continual robe of white during the whole year. This land is too phenomenal to fully realize its marvels, and bards have failed to portray its mysteries.

JAMES E. DONNELL, Mount Ararat, Raniho, Cal.

The Sappodilla in the Bahamas.

The Giant Sappodilla grows on a handsome, thickly-leafed tree, resembling in general appearance our thrifty chestnut tree, and bears fruit as large and luscious as our Duchess pear. The Dwarf variety has a dense foliage, and yields enormously. The fruit is clustered in bunches like the crab-apple, or cherry, and averages in size with the large egg-plum. The fruits of both sorts are oblong and smooth, the pale green skin is rough, as if it had been dusted over with gritty brown sand, giving it the appearance of an Irish kidney potato, and rendering it disagreeable to handle. As in the orange, the meat of the sappodilla lies in clean sections, but moistened by a sweet liquid, is less adhesive, the quarters cleaving apart of themselves, the instant the peel is removed. Between the quarters, lie a half dozen flat, black, shining seeds, oval in form, and nearly an inch in length.

To be appreciated, the sappodilla must be eaten at the acme of ripeness. When the least underripe it exudes a thin, sticky, milky liquid, and is puckery and unpalatable; overripe, it is pithy and juiceless. As the fruit is bountifully prolific, and peculiarly sweet and nourishing, the colored natives subsist almost wholly upon it during the season. It is not a favorite with transient visitors to the Bahamas, but to those who have acquired a taste for it, there is among the many fruits grown in the West Indies, none more delicious than a perfectly ripened, freshly gathered sappodilla. It is a deprivation to Northern countries that the sappodilla will not bear transportation.

GORHAM SILVER, Nassau, Bahama Islands.

Farming Near the North Pole.

Our methods of farming are not strictly in accordance with science. Although we find many valuable hints in the AMERICAN AGRICULTURIST, climatic conditions and local considerations require us to adopt special methods. As to the fertility of our soil, and the suitability of the climate for raising all the hardy varieties of grain and vegetables, there can be no doubt. In twelve years we have only failed of good crops once, while most of them have been exceptionally heavy. With the most ordinary cultivation, we grow from two to four hundred bushels of potatoes, and upward, per acre. The heaviest potato that I have weighed was three and one-fourth pounds, and, from three pounds of Early Rose seed, I dug six hundred and seventy-two pounds of sound potatoes.

Last season I weighed a turnip, that had had only ordinary field culture, without fertilizing, which weighed twenty-two pounds ten ounces. I afterward picked up four more that brought up the weight, with the first one, to ninety-three and a half pounds. We have always been obliged to tread out our grain with horses or cattle, and the net results have not been what they would with a good thresher, yet we have, even in this way, obtained a fair yield per acre. We have had a steam saw and grist mill since 1886, and this year we have a steam thresher. Before the introduction of machinery, flour was not to be obtained for less than forty to fifty dollars per barrel, and was to be had only in the most limited quantities; now it has become, as elsewhere, a household staple.

E. J. LAWRENCE, Peace River, Canada.

It Pays to Paint.

One of my neighbors was obliged to sell. His farm was worth twenty-five hundred dollars, and that was the price asked for it. The buildings were comparatively new, but they appeared old owing to the lack of paint. They were painted when built, but not since, and had a dreary, weather-beaten appearance. The house had had bright green blinds, but the blinds not wrecked by the wind were dilapidated and yellow. The land was good, a little worn, but needed only

fertilizers to give it new life. But the highest price offered for the place was fifteen hundred dollars. He was in despair; the place was worth more, but he needed the money and must have it. While he was considering the offer one of his neighbors drove up.

"Well, John, how do you get on selling the place?"

"Got to sell for fifteen hundred. That's all I'm offered."

"You ought to get twenty-five—every cent of it. Now, I'll tell you how you can get that ten hundred, or a good part of it. Paint the house and barn, and get a new set of green blinds for the house, and touch up the fence."

"But I've no money."

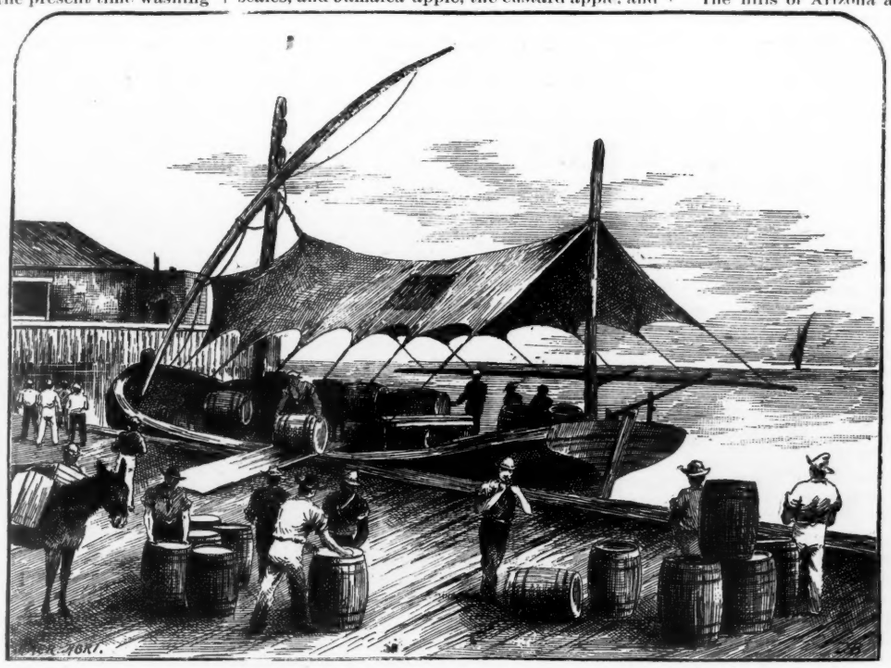
"Don't need any. Get trusted for the paint, add the paint to the price of the farm, and hold on till you get your price."

He held on till he sold the place for twenty-eight hundred dollars.

G. A. STOCKES, Providence Co., R. I.

Prospecting for Gold.

Prospecting for gold is constantly going on, in the Selkirk Mountains especially; and in the valley of the Fraser River—that El Dorado of earlier settlers—even at the present time washing the river bed is carried on by Chinamen. The ground, however, has been well sifted, and what remains of the precious metal is hardly tempting enough for more ambitious spirits, though I have seen isolated cases where sluices have been erected along the river bank and controlled by white men. The magnificient waterway also yields an enormous quantity of fish, and salmon canneries, at convenient points, distribute this article of food to all parts of the world. Indians and Chinamen are both engaged in the catch. The terminus of the Canadian Pacific Railroad at Vancouver, has gathered around it within the last few years a large town with enterprising inhabitants. Previously Port Moody, at the head of Buzzard Inlet had been the terminus; now, however, this town has very little importance. All around the shores of the Inlet, sawmills are in operation, and vessels of all sizes load with lumber for European and other ports. Vancouver has easy communication with Victoria, the capital, and is the starting point for the Trans-Pacific and Australasian lines. Steamers also proceed to Puget Sound ports. Nanaimo, on Vancouver Island, is the coaling station for the fleet, and the output from this port is large enough to, and indeed does, furnish California and other Southern States with its useful commodity. EDMUND PARKER Vancouver, B. C.



LOADING A SUGAR-LIGHTER AT MATANZAS.

Heavy Shipments of Sugar from Cuba.

The shipments of sugar from Cuba to the United States this season are the largest which have ever been known. All the works in Cienfuegos, Matanzas and other manufacturing centers have been in operation night and day since the beginning of October, and the product is now moving northward by every outgoing steamer and sailing vessel. The shipments during the last three months of 1891 are estimated to have exceeded those of a corresponding period of the previous year, by at least $5,000,000. The sugar is brought from the boiling-works by railway and mule to the wharves and is carried out by lighters to steamers and vessels anchored in the harbor. In order to protect the sugar from extreme heat, the lighters are covered with canvas awnings. The shipping facilities at Matanzas are inferior to those of Cienfuegos on the south side of the island, where steamers can be loaded directly from the wharves. American capital is going heavily into Cuban sugar production. During the last six months every incoming steamer has brought improved machinery, and many sugar estates have changed hands. Representatives of New York syndicates are taking up permanent residence in the island. The signs of the Americanization of Cuba are multiplying on every side.

"AGRICULTURIST READER," Matanzas, Cuba.

Tropical Fruits for South Florida.

There is a long list of tropical fruits that mature only at certain seasons of the year. Prominent among these may be named the mango, to those who know it in its perfection the best fruit of the world. The tree itself is one of the most striking objects of the tropics for either grove or lawn. In August and September the avocado pear gives us its rich egg-like pulp, a real treasure. To these we may add, the ti-ep or egg-fruit, the mammee, sapota-mammee apple, cashew nut, and the tamarind. Then we come to that strange group of fruits, always so much prized by the dwellers of the tropics, and too delicate both in tree and fruit for any but a tropical home, viz., the anonas; first, the sugar apple, like a mass of sweetened cream wrapped in its tender green scales, and Jamaica apple, the custard apple, and the soursop The latter, to many, the best of all the anonas, and the tree itself, so tender as to suffer by a temperature that approaches frost. Such are some of the fruits of our Florida home. The choicest treasures of the hothouse here rejoice in an open air culture. It is not easy to measure the possibilities of a region where the most delicate treasures of the floral kingdom grow side by side with the most choice of the semi-tropical fruits as well as those of the torrid zone. E. GALE, Dade Co., Florida.

Agriculture in Arizona.

The real agricultural section of Arizona lies in what is known as the Salt River country. This includes a greater area than the valley itself, and may, in round numbers, be estimated at 100 miles long by 40 miles wide, thus including parts of the Gila Valley, Salt River Valley and one or two other streams. The northern parts of the Territory are rougher and more mountainous, they contain some small and fertile tracts, but they are not so well adapted to fruit growing as the region referred to.

The apricot ripens two weeks earlier than in California, but it lacks size and flavor. The peaches are a little earlier than in California, but the trees die young. It is thought that it is due to alkali in the soil, the grape succeeds best of all fruits, but it will never compete with the California grape for shipping on account of its small size. The citrus fruits do not thrive in perfection, owing to the cold winter weather. In the mountainous parts of Arizona, very choice apples are grown, and in time extensive orchards of this fruit will be planted.

In the growing of alfalfa, and in the breeding of hogs and cattle, Arizona has a splendid future. Alfalfa yields enormous crops, and grows during the greater part of the year with astonishing vigor, five or six crops of hay being often cut. All fruit, grain and vegetables must be irrigated. The soil is loose and rather porous or ashy, so much so in some localities that it is impossible to obtain water enough for irrigation. The continued irrigation makes the ground soft, and horses, though large, are too logy, while their feet are too soft for good roadsters. All wheat and corn must be irrigated, and wheat that is irrigated is not so good as that grown on dry lands. So distinctly is this recognized that California wheat commands a higher price than the Arizona wheat, and flour from the dry wheat is worth 50 cents more per hundred pounds. Barley is, however, unsurpassed, and this grain yields large crops. Potatoes raised in Salt River Valley are hardly fit to eat, so that the bulk of the potatoes used is brought from Southern California or from Salt Lake. Cabbage does fairly well, and so do beets, carrots, turnips, etc.

The hills of Arizona are unsurpassed in many sections for grazing, but sheep are not profitable on account of the thorny underbrush which pulls off the wool. There is hardly enough mutton raised to meet the local demand. Cattle do well and winter easily without being fed hay. Figs, grapes, apricots and peaches ripen early. One disadvantage of high temperature in summer, is to cause the peach to ripen upon one side while the other is still green. Snow falls according to the altitude, but even upon the high mountains it is not deep, and grass grows to the very top of the hills. The rivers flow mostly in deep cañons, thus making irrigation in many places impossible, yet irrigation is needed to insure good crops The extensive irrigation works that have been undertaken during the past few years will work marvelous changes in Arizona for the hot climate, combined with an abundance of water will produce immense crops. When these canals are all completed, the productive area will be greatly increased, and the yield of alfalfa will support great numbers of cattle, horses and sheep. While Arizona may never rank with some of the other Pacific States in productiveness, yet as the quantity of water for irrigation is increased, her arable land will be extended, and thousands of acres of what is now called desert lands, will then be made to produce fine crops of wheat, corn, alfalfa and fruit.

S. S. BOYNTON, Pima Co., Arizona.

South African Cereals.

The upland regions of South Africa are peculiarly adapted to the cultivation of wheat and every kind of cereals. The Transvaal grows some of the finest wheat in the world, and was awarded a prize at Paris Exhibition of 1867. The Boers grow sufficient for their own consumption, and under the stimulus which the gold industry is giving to the country they will gradually be drawn to extend the area of cultivation, and in this way one source of wealth will give birth to another. The cereal, which is universally grown from Capetown to Cairo, is maize or mealies; it forms the staple diet of all native tribes. Owing to the quick growth which is characteristic of Africa, it is only necessary to plant half the amount of seed per acre to that planted in colder climates. ANNIE RUSSELL, Natal, S. A.

FARMING IN FOREIGN LANDS.

There are 223 beet-sugar factories in European Russia.

A hop picking machine has been invented in Australia.

New Zealand flax is being successfuly grown on the Azores.

The cotton industry is attracting attention in Queensland.

One out of every seven landowners in Great Britain is a woman.

In Kent, England, 30,000 people are engaged in hop picking during the season.

In Germany, budding and grafting are taught in the national country schools.

Rust has done some damage to wheat in Tasmania, owing to wet weather.

Sixty American Merino sheep have recently been shipped, *via* London, to Sydney.

The export fruit trade of Jamaica increased from $250,000 in 1880 to $5,000,000 in 1890.

Tomato rot is successfully kept in check in India by the use of Bordeaux mixture.

Great Britain has 150,000 acres of orchard, an increase of 50,000 acres within 20 years.

In Manchooria, China, are large dog farms, the dogs being fed for the value of the skins.

In Mauritius there are over 250,000 Indians, most of whom are coolies working on the sugar estates.

Tobacco is being largely grown at Cape Colony, and experiments are being made there in cotton culture.

A single shipment of butter from Victoria for England consisted of 9,000 cases weighing 235 tons, and valued at $125,000.

Cape Colony possesses 1,500,000 head of cattle, 14,500,000 sheep, 5,200,000 goats, 300,000 horses, 65,000 mules and 150,000 ostriches.

Large and deep peat beds exist in the Falkland islands. They are formed entirely of roots and stems of a species of crowberry.

The Victorian government proposes to adopt a system whereby all butter exported, will bear a government brand on the packages.

Choice poultry is being imported into Natal, especially Light Brahmas, Indian and Pile game, Black Spanish and Silver Dorkings.

Exports of coal from New South Wales were valued at $6,596,455 in 1889, and at $4,935,865 in 1890. The decrease was due to the great strike.

A Ceylon tea grower has been investigating Southern California in regard to its adaptability for tea culture, and was favorably impressed.

In Newfoundland, the pine, spruce, birch, juniper, aspen, mountain ash and larch furnish plenty of timber for the lumber trade and for shipbuilding.

French makers of Gruyère cheese feel the competition from importations of the same grade of cheese manufactured in Canada and the United States.

The vineyards along the border between Victoria and New South Wales were badly frost-bitten, and the vintage of 1892 will be materially reduced.

The most important industries of Cape Colony are diamond and copper mining, wool growing and ostrich farming. Wool growing is the most important.

Malta is famous for its flowers, and its fauna is almost entirely European. The chief products are cotton, corn, oranges, melons, potatoes, figs and grapes.

Ceylon coffee used to bring the highest price in the London market, but a fungus ruined the coffee crops which are now superseded by tea plantations.

Agriculture occupies the attention of the bulk of the population in Cyprus, the chief products being grain, locust beans, sesame, cotton, olives, silk, fruit and wine.

Canada exported in 1891, agricultural products to the value of $13,666,858, and forestry products worth $24,282,015. New Brunswick's lumber exports were one-sixth as much.

Grass seed is a nuisance in parts of New South Wales. It is injurious to the mouths of horses and cattle, and has destroyed the first crop of lucern. The worst seed is that of the barley grass.

New Zealand has 207,000 cows, and produced, in 1891, 16,310,000 pounds of butter and 6,976,000 pounds of cheese. This was more than double its product in 1881, and 50 per cent. more than five years previous, showing a very rapid development of the dairy industry.

The quantity of coffee exported from Nicaragua in the last ten years has increased from 12,000,000 to 19,800,000 pounds annually, mostly to Europe. One acre produces about 500 pounds of coffee.

Silk culture will soon be attempted in Jamaica, and efforts are being made to establish essence distilleries, so as to utilize the perfumery of the magnificent and varied flowers grown on the island.

Coöperative farming is suggested in Scotland, the idea being to rent farm lands on long leases in preference to buying them. It is thought this can be done with a capital of $50 per acre to stock and start the farm.

The area suitable for the growth of cocoa in Ceylon, is limited according to soil. Between 1886 and 1891, the quantity exported has not increased by 50 tons, and a total annual product of 1,000 tons will be an outside limit.

Imports of eggs into New South Wales have been:

Year	*Dozen*	*Value*
1887	288,694	$ 64,045
1888	522,902	121,430
1889	370,093	83,420
1890	681,853	162,455

Queensland exported 32,629,000 pounds of wool in 1891, being 13,430,000 pounds more than in 1890. This colony also exported 5,340 tons of frozen meat in 1891, a gain of 2,318 tons over 1890. There were also shipments of 1,130 tons of preserved meats.

From the Gambia there are 20,000 tons of ground nuts annually exported, mostly to Marseilles, where the oil is extracted. Rice, cotton, maize and a grain known as *Kous* are also largely grown in Gambia, and the rubber tree is now being extensively cultivated.

A colonial butter factory at Berry, N. S. W., received 84,457 gallons of milk in one month, yielding 31,253 pounds of butter, which sold for 18 cents per pound. Farmers were paid five and one-half cents per gallon of milk, and it required 26 pounds of milk to make one of butter.

India will require from 1,500 to 2,000 horses for military purposes during the next season, 1892-93. Most horses used by the English army in India are imported from Australia, and cost from $500 upwards, making an annual expenditure for this purpose alone of about $1,000,000.

Eighteen dairy lectures in one county of Scotland were attended by over 1,600 people. No less than 250 people competed in the examinations for prizes, and the Royal Northern Agricultural Society claimed that no work undertaken for many years previously had done so much good.

At Bremerhaven, in Germany, American cattle are admitted on condition that notification of their landing be previously made to some competent medical authority at the port of entrance. But all cattle, except those for breeding purposes, are isolated four weeks at the cost of the owner.

The Ayrshire Agricultural Association has held 29 annual cheese fairs. The last season was unsatisfactory owing to a diminished yield and an increased cost for feeding stuffs, these two causes combined being equal to fully a half year's rent. The entries at the last fair included 452 cheese and 271 butter exhibits.

The New England district in New South Wales, bordering the coast between Sydney and Melbourne, Australia, is decidedly progressive. It is a fertile tract, at present devoted mainly to fruit growing. There is room for a population of a million, and efforts are being made to erect co-operative dairies, bacon factories, meat freezing, cold storage and fruit preserving works on a large scale.

The suggestion is made in Queensland to encourage the breeding of marsupials, and not to exterminate them. A sheep ranch that will carry 20,000 sheep would carry 30,000 kangaroos, and there would be no deaths from cold or loss of mothers as in lambing. American buyers pay $50 per dozen for kangaroo skins delivered in Australia.

Shorthorns in England are depreciating in value. For 10 years, ending 1890, the annual average of sales of Shorthorn stock was 39, the total number sold was 1,731, and the average price paid was $172.29 per head. In 1891, the average price had dropped to $128.37. The introduction of coarse Scotch Shorthorns is said to have had this injurious effect.

Exports of Australian wines for three years were:

From	GALLONS. 1888	1889	1890
Victoria	164,417	159,080	146,663
New South Wales	41,023	58,378	48,480
South Australia	128,364	178,821	220,519
Totals	333,804	396,279	415,662

The exclusion of American meat from France resulted in the poor eating less meat and using inferior meat, the consumption of horses, mules and asses having largely increased of late years. Imports from America must be examined and tested by French officials who decide upon the fitness of the meat for food. The United States government will insist upon the recognition of its own inspectors' stamp as a guaranty of quality entitling our meats to exemption from French inspection.

Vegetable fiber takes the place of animal wool in Germany in the manufacture of many under garments. At two factories, near Breslau, pine leaves are made into wool, and flannels and blankets of the same materials are employed in hospitals, barracks and prisons. Underclothing is also made from vegetable wool. The long leaf pine of our Southern States is utilized by a North Carolina concern in making mats and also as a substitute for hair and excelsior in cushions, mattresses and like purposes.

Horse breeding in France is regulated by law. There are 2,500 national stallions of all breeds, which served, in 1891, 139,053 mares. Fees received amounted to $186,320, and the production from services was 70 per cent. The number of stallions examined in the past three years was:

Accepted	1891	1890	1889
Thoroughbreds	125	123	118
Half-bred	934	907	909
Draft Horses	4,933	4,717	4,396
Total Accepted	5,992	5,747	5,423
Rejected	181	204	216
Total Examined	6,173	5,951	5,631

In Uruguay some 700,000 cattle are slaughtered annually, the population being 650,000. The value of an ox is: For meat, 150 pounds, $9.90; hide, 68 pounds, $7.74; tallow, 40 pounds; $2.49; remnants, 50 cents; total, $20.63; expenses at yards, $3.60. There are also 500,000 head used for home consumption and shipping, and 100,000 head exported alive. The annual exports of meat products are about 143,000,000 pounds, of which 70,000,000 are jerked beef or dried meat, pressed meat, 3,500,000; extract of meat, 1,000,000; grease, 35,000,000; tallow skins, 12,000,000; hair, 3,250,000; and fertilizers 9,000,000 pounds.

The foreign market for American produce is largely due to the great number to be fed, rather than to the amount consumed *per capita*. Thus the United States Commissioner of Labor finds that the average American ironworker consumes four and one-half bushels of potatoes to the Englishman's five and one-half; sugar, 82 to 23 pounds; butter, 44 to 25; meat, 179 to 75; flour, 306 to 219; coffee, seven to three, while of tea the American laborer uses about seven to the Englishman's six pounds, both consuming about the same quantity of eggs — some 13 dozen a year. The American spends $243 every year for food, while the European wage-earner spends $222, though earning only half as much; for life insurance, $21 yearly against only $9.50; for charity and religion, $12 to $7; while here one ironworker out of five boards in his own home against one in 25 in England.

There is no duty upon fertilizers imported into New South Wales, and a genuine concentrated superphosphate would be in demand among farmers who use only bone dust fertilizers prepared at boiling-down and meat-preserving establishments, and a fertilizer prepared by the Colonial Sugar Refining Company, its capacity being limited to 2,600 tons per annum. The bone dust fertilizers are sold at $26.25 per ton. They vary in composition from 19 to 23 per cent. of insoluble phosphoric acid, and one to four per cent. of nitrogen. The superphosphate sold from the sugar refineries is made from the bone ash used in refining sugar, and is sold at $25 per ton under a guaranteed analysis of 16 per cent. of soluble phosphoric acid. There are no deposits of mineral phosphates in the country, and the soil, which has met all demands for 25 years past, is now beginning to need a proper system of fertilization. The European demand for fertilizers is also largely increasing.

SCIENCE IN FARMING.

THE GROWTH OF VEGETABLES.—This bulletin gives notes on the growth of standard vegetables under like conditions of soils and treatment. Of fifty-five varieties of tomatoes, the earliest were Livingstone's Perfection, Early King Humbert, Livingstone's Beauty, Cardinal, Livingstone's Favorite and Large Round Yellow. Still there is only four days' difference, the Early King Humbert being the earliest. This variety is valuable only for this quality, however. The Large Round Yellow is productive, and has large fruit, but is not a strong grower. Livingstone's Perfection was one of the best. The fruit was solid and regular, round and smooth, but the plant was not productive. Of radishes the Charteris and Improved Charteris were found to be identical. The Olive Rose is a good table variety. The French Breakfast resembles it. The Charteris was found to be the most valuable. Of a large number of cauliflowers the American Erfurt and Early White French were characterized as very good; also Carter's Extra Early Autumn Giant. While all of these varieties may not do as well in all other sections they have good reputations everywhere. Oregon's climate is like that of Southern New England, only there is more rainfall.—Oregon, No. 15, Pages 15.

EFFECT OF SPRAYING ON THE APPLE SCAB.—This subject was investigated most thoroughly at the Ohio Station last season. The conclusions may be stated briefly as follows: The growth of the scab fungus may be checked by spraying the trees at proper times, during the spring, with several of the copper compounds used as fungicides. The most convenient and satisfactory one tested so far, considering the cost, convenience, and effectiveness, is a dilute Bordeaux mixture, containing four pounds of copper sulphate, four pounds of lime, and 50 gallons of water. While it has not been found practicable to completely prevent the growth of scab in a single season, the experiments demonstrate that it is practical to so reduce the injury from the fungus that the total value of the crop will be greatly increased, far more than is necessary to repay the cost of using the fungicides. Judicious spraying with fungicides also tends to check the dropping of immature fruit in the spring; to cause it to grow larger in size; more free from blemishes; to hang better on the tree while ripening, to take on a higher color, and to improve its keeping quality. Measured by the market value, spraying added nearly 100 per cent. to the value of the crop, at less than fifteen cents per tree. It has also been demonstrated that the plum curculio may be held in check by spraying, almost as effectually as by jarring, and far more cheaply.—Ohio, Second Series, No. 9, Pages 42.

THE SOUTHERN TOMATO BLIGHT.—This disease, so called to avoid confusion, as it is most injurious in the Gulf States, did not assume alarming proportions until 1889. It can be recognized by the wilting of the plant, and particularly of the young upper leaves and growing tips of the stem. Usually the older leaves have turned yellow and hang lifeless before the wilting is noticed. Close inspection shows that particles of the stem and the adjoining leaves have a moist appearance, similar to the so-called "water core" in apples. When cut lengthwise, such stems show a watery pith, which has a greener color than the center of the normal stem. Plants longer affected have the greenish color replaced by a light brown, irregularly scattered, which is particularly prominent in the woody substance. The lower leaves sometimes become yellowish, and with soft, almost slimy bases. This disease was studied by Dr. Byron D. Halsted, of New Jersey, for the Mississippi experiment station. Dr. Halsted found that the affected plants showed the presence of large numbers of bacteria, while all traces of fungi, common to rusts, smuts, and mildew, were invariably absent in freshly-gathered specimens. Nearby potato fields also showed the presence of this blight, as if it was contagious. These conclusions were reached: The blight seems to be due to a bacterial germ. As far as observation goes, the blight is not limited to any soil, situation, or exposure, but may be found anywhere. It is probable that plants may be attacked before being set in the field, as well as afterward. There is a potato blight due to bacteria which is communicable to the tomato, as inoculation shows, and this disease seems to be the same. Melons are also sometimes affected with what seems to be the same blight. If these statements are true, the soil may become so contaminated with bacteria from any one of these three crops as to make it unfit for the other two. The potato seems best adapted to disseminate the blight, in the tubers, and special care should be taken not to plant them. As the Bordeaux mixture has proved effective with potatoes for bacterial diseases, spraying with this compound is recommended for all three crops where fear of blight is entertained. Care should also be taken to burn the diseased plants when found, and also all litter in the field at harvest time. This subject will be further investigated this season.—Mississippi, No. 19, Pages 12.

ARTESIAN WELLS FOR IRRIGATION. — In California over 60,000 acres are irrigated from artesian wells. In India, Turkey and Algiers they are very common. Scientists in Colorado are studying to see under what conditions artesian wells exist there, and also to learn how much dependence can be placed upon them for irrigating purposes. (Colorado, No. 16, pages 28.) They are already a big addition to the State's resources. A water right is even now a valuable franchise. In some of the older settled districts the water for 80 acres now brings over $1,200, even in ditches that do not have water in times of scarcity. In the Greely community, where farming has been carried on for 20 years, a stream not exceeding 1¾ cubic feet per second was bought for $5,000 and is thought a good investment. Artesian wells are considered valuable for irrigating purposes because of their steady flow through all seasons of the year. But it is a rule, rather than an exception, throughout the artesian basins of this State to meet with wells whose pressure is decreasing. This is due either to too many wells or to defective construction. Indications point to the latter as the cause in the majority of cases. Many wells are improperly cased, and some not at all. Such methods of false economy may result in disaster in the future, not only to individual wells, but to the whole basin. This will be readily seen when one stops to consider the principles upon which artesian wells are based. The water is confined under great pressure between two impervious layers of earth. If the upper one is punctured the water escapes to the one above or to the surface soil and so wastes, thus reducing the pressure. This shows the necessity of thoroughly packing the casing at the impervious strata. The law should require every well sunk to be completely cased, and abandoned wells to be plugged. The pressure of any well may be measured in pounds per square inch by attaching a hose pipe, being sure there is no leak whatever to the well, and holding it in the air to just the height the water will flow out. Try this two or three times, taking the average height, and then divide by 2¼. There is a limit to the number of wells that any basin will contain to advantage, and calculations are being made to see how much increase the different basins will stand.

A CHEMICAL STUDY OF THE COTTON PLANT.—Very little on this subject has been published before. This bulletin (Tenn. Vol. 4, No. 5, pages 15), gives analyses of the lint, seed, boll, leaves, stem and roots, and also of the whole plant combined. These analyses are arranged to show as much as possible regarding the kind and amounts of fertilizing elements the plant takes from the soil. Repeated trials indicate that the average weight of chemically dry lint to one acre of the crop tested was 300 pounds; of seed, 654 pounds; bolls, 404 pounds; leaves, 575 pounds; stems, 658 pounds; roots, 250 pounds; making a total plant product of 2,841 pounds to the acre. This weight contains, in round numbers, 46 pounds of nitrogen, 12 pounds of phosphoric acid and 39 pounds of potash, besides soda, lime, magnesia, sulphuric acid and insoluble matter. The 300 pounds of lint, which, under proper methods, is the only part of the crop that is not returned to the soil, contains, of nitrogen 0.72 of a pound, phosphoric acid 0.18 pound and potash 2.22 pounds—far less than an ordinary grain crop removes from the soil. More than half of the valuable constituents of the cotton crop are left behind, whereas, with corn and oats, only small amounts of shallow growing roots and stubble are left. It is folly to burn the stems, together with the remaining bolls, and such parts of the roots as are removed from the soil when the plant is pulled up. The total nitrogen in the bolls, stems and roots is nearly 11.3 pounds. In burning the refuse, fully half of this nitrogen and part of the potash are volatized, while the organic matter, also valuable to the soil, is lost. Fertilizer tests, made by plots with all three plant-food constituents, separately and in groups, showed that cotton needs all three. Phosphoric acid, alone or in combination, gave the best results, and nitrogen next Nitrogen and potash applied separately, were of little value, but with phosphoric acid doubled the yield. These mixtures were effective: No. 1. Acid phosphate 420 pounds, nitrate of soda 125 pounds, and kainit 125 pounds. No. 2. Acid phosphate 370 pounds, dried blood 165, and cotton-seed hull ashes 60 pounds. No. 3. Stable manure two tons, acid phosphate 330 pounds and nitrate of soda 20 pounds. No. 4. Acid phosphate 350 pounds, cotton-seed meal 280, and muriate of potash 20 pounds. No. 5. Acid phosphate 350 pounds, cotton seed 800, and kainit 40 pounds. No. 6. Stable manure two tons, acid phosphate 330 pounds, and cotton-seed meal 40 pounds. These amounts are to be applied to one acre.

WEEDS AS FERTILIZERS.—"A weed is any plant that seeks to grow where it is not wanted by him who utilizes the soil, no matter for what purpose." (West Virginia, No. 19, Pages 9.) This bulletin shows the high value of the majority of common weeds as a fertilizer. It gives the names of 50 of the leading ones, with the average amount of nitrogen, phosphoric acid, and potash they contain, with the commercial value in dollars and cents, per ton. It also gives, in detail, how to treat weeds for the compost heap, which is the best method of preparing them to be returned to the soil. The value of some weeds is rather surprising. For example, 100 pounds of poke weed (*Phytolacca decandra, L.*) contains 3.34 pounds of nitrogen, .65 pounds of phosphoric acid, and eight pounds of potash. This fertilizer has a commercial value of $21.93 per ton. The value of a few other weeds per ton as a fertilizer, calculated by the method used for commercial fertilizers may be interesting. Bitter dock (*Rumex obtusifolius, L.*) is worth $16.26, burdock (*Arctium lappa, L.*) $11.69, ox-eye daisy (*Chrysanthemum leucanthemum L.*) $16.66, toad flax (*Linaria vulgaris, Mill.*) $10.27. These figures show that weeds are well worth caring for. In addition to this is the humus, so necessary to make mineral elements available as plant food, which brings the value of the green plant up nearly as high. Weeds should always be cut before the seeds mature, but there are objections to burning, or leaving in the field to rot. The former method destroys the humus and volatilizes the nitrogen, the two most valuable qualities. More than half the nitrogen is lost if it rots in the field. The compost heap makes everything available. This should be located with reference to as little work as possible, near a water supply, if in the field. Make a base of old fence rails, thick poles, etc., that will allow air circulation underneath. Dump a load of weeds and then apply plaster (sulphate of lime), at the rate of 100 pounds per ton. Repeat this until the pile is as large as desired. Cover with turf or earth. In four or five days, if the heap is not wet, throw on some water, to help decomposition, but not to leach. Such a heap will ripen in about two months. Weeds may, also, be composted with barnyard manure, bedding, or other refuse, to advantage.

INSECTS INJURIOUS TO STORED GRAIN.—The three insects most injurious to grain in the South are the Angumis grain moth, the black weevil and the red grain beetle. The transformation and habits of these insects are about the same. The eggs are laid within the grain, both before and after it is gathered, and the mature insects come forth in three to six weeks after the eggs are laid. Their depredations are not confined to any one cereal, and by their work they cause a marked decrease in weight. Sulphur, or salt, sprinkled in husked corn will tend to drive the insects away. The best remedy for grain insects is bisulphide of carbon. For this a "quarantine" bin should be built and the grain treated in it as gathered. The amount of bisulphide needed varies with the tightness of the bin but, as a rule, one ounce of bisulphide to 100 pounds of grain is sufficient. As the bisulphide is explosive, all lights from matches, cigars and the like should be kept away until all odor from the fumes has passed off. Insects in mills should be treated with bisulphide, beginning in the basement and going upward. To destroy all insects in the spring with bisulphide in or near the empty granary will tend to decrease any damage done the next fall and winter.—Mississippi, No. 17, Pages 16.

Evergreen Fern.—William Otts, Wayne Co., N. Y.: The evergreen fern, a fragment of which you send, is *Aspidium acrostichoides*. It is common in rocky woods, and has a choppy root stalk which may be readily lifted entire and transplanted to your garden, provided you give it a moist, shady position in which to grow. We have many wild ferns which are well worth a place in our gardens, but few will succeed in positions fully exposed to the sun, or in very dry soils.

Tar Paper Again.—E. A. Bennett, Cobell Co., W. Va.: The tar paper recommended for wrapping about the stems of trees, to prevent girdling by mice and rabbits, is the kind used by builders for lining walls, roofing, and other purposes. There are several qualities of this paper, such as single, double, and three-ply, and others made with strong, thick cloth, coated on both sides with tar. The ordinary single-ply paper will answer your purpose, and costs, here in New York, less than two cents per square yard. We have never found it at all difficult to cut up any grade of tar paper, although you say that you have found it impossible. Use a sharp knife, dipping the blade, occasionally, into spirits of turpentine, or use a large pair of shears. When cutting with a knife, the paper should be laid flat on a board. The size of the pieces will depend upon the size of the stems of the trees to be protected. If you cannot get the right kind of tar paper, use common brown wrapping paper, and, after this is applied to your trees, coat the outside with tar, applying it hot, with an old paint brush.

Wood Ashes on Vegetables.—W. H. Stetes, Jr., Westchester Co., N. Y.: The ashes from timber burned in clearing up a wood lot, and now stored under a shed, are in the best possible condition for applying to the vegetable garden. It will not do to mix the ashes with chicken manure, because the potash in the ashes will liberate or set free the ammonia and other volatile gases, which should not be lost, as they are valuable elements of the food of plants. If ashes or lime are to be mixed with the droppings of fowls, they should always be accompanied by a large quantity of dry muck, peat, loam, or plaster as absorbents of the escaping gases. Compost your hen manure with good loam or leafmold from the woods, and you will add something to its value, and get it into a better condition for handling and even distribution over your garden. The ashes are already in the best form possible for distribution, and may be used as a fertilizer for all kind of plants with equally certain beneficial results.

Pecans and Walnuts.—H. E. Slack, Jackson Co., Mich., asks our opinion in regard to the best section of country in which to raise pecan and English walnuts, as well as the best kind of soil. As it is well known that the different varieties of the English walnut and the pecan nuts are not, as a whole, hardy in our more Northern States, we would certainly choose a warmer climate if we intended to make a specialty of cultivating these nuts for market and profit. If we were to select a desirable location for cultivating the nuts named, it would not be north of Virginia, and on bottom lands in perference to those that are high and dry. Both pecans and English walnuts as well as our native butternut, succeed best in what are called alluvial lands where the soil is rich and the roots come in contact with moisture at all seasons. You can start with the nuts, or by purchasing trees of several years growth at the nurseries, all depending upon the depth of your purse or the time you are willing to wait for a crop of nuts.

Yellow Jackets and Prunes.—M. Catendo, Hunt Co., Cal.. The little variegated wasp (*Vespa*), widely known as the Yellow Jacket, is often very destructive to peaches and similar fruits in the Atlantic States, and it may be that the same species extends to California. It may be that this pest could be destroyed by feeding it poisoned syrup. There does not appear to be any place for the fruit grower to pursue his labors without molestation from some kind of insect pest. The Yellow Jackets destroy your prunes and peaches as they often do here, but in Arizona, that new land of promise, a large, green beetle (*Allorhina mutabilis*), attacks peaches and apricots as soon as they approach ripeness, and sucks out the rich juice. Wherever man can live, noxious insects seem to thrive.

More About the Ostrich.—A Subscriber, Livingston Co., N. Y.—A full grown male ostrich will weigh from 200 to 300 pounds. The females are a little smaller than the males, probably averaging 50 pounds less in weight. The flesh of the ostrich is frequently used as food in its native country, and that of the young birds is said to be excellent, but that of the old ones is rather hard and tough, but not inferior to that of an old turkey. Ostrich eggs are of excellent flavor, and not strong, as we might expect from their large size. Some authors give their weight as from two to three pounds, while others say from three to five pounds. They are from five to six inches long and hold about forty fluid ounces, or equal to about two dozen ordinary hen's eggs.

Plants Over Water Pipes.—W. H. Cutter, Santa Clara Co., Cal.: The rank growth of vegetables which you noticed where water and sewer pipes were laid was no doubt due to both deep trenching of the soil and the condensation of moisture by the cool air passing through the pipes. Some water may have also escaped through the pipes at the joints, but this would probably not have been enough to produce the results you noticed. A soil deeply trenched in your climate will certainly retain moisture much longer than one left hard and compact. Try a square rod or more and note the results. Also lay a common drain tile, for a few rods, two or three feet deep and in such a position that both ends can be left open to the air, and see if it does not have a similar effect upon vegetation above, even if no water at any time passes through it. If we can conduct atmospheric air through the soil, it is pretty sure to leave much of its moisture behind.

Adaptation.—J. Ryma, Allegany Co., N. Y.: It is certainly better to have the soil and climate adapted to the crops or plants we purpose cultivating than otherwise, but we cannot always secure just the right conditions; consequently, we must overcome difficulties with labor and skill. If your soil is too heavy, hard and poor for the trees or other plants you desire to cultivate, break it up, enrich and add some kind of material which will make it light and fertile. If it is cold and wet, underdrain and plow deep, using a subsoiler. On very light and dry soils, trees should be kept well mulched during the growing season, if not all the year round. While we must admit that there is much in the adaptation of plants to soils, this does not prevent the skillful cultivators bringing together an immense number of different kinds and species, as seen in any of our larger nurseries. If nature has not provided the proper conditions, we must provide them by artificial means.

Mixing Cement.—W. P. S., St. Lawrence Co., N. Y.: In mixing concrete, or hydraulic cement, too much water is commonly used. This greatly weakens the cement and makes it crumble. Mayor Gillmore's rule for the proper quantity of water was to use only so much that the finished mass would be about as damp as brown sugar. When in this condition it cannot be spread very well, but has to be rammed or patted into position. In mixing, the water is put on with a sprinkler, and at no time is the mass allowed to be wet. For cement mortar 300 pounds of cement (or one barrel), two barrels of sand and half a barrel of water will be found a fair proportion. This will cover 192 square feet one-half an inch thick. The finer the cement is ground, the better. After mixing, disturb it as little as possible. Working is of no advantage to it. After it has begun to set it must be left alone, or it will be weakened. Mix and use as quickly as possible, but it should be remembered that the greater part of the mixing should be done while the materials are dry.

Laying Capacity of Hens.—G. Smith, Tex., asks, "Whether, as a general rule, a hen lays her eggs one every day or every other day, etc." There is no general rule about it. Some hens will lay seven eggs a week, that is one each day, while others will lay every other day and some only one egg in three days. As a rule, the everyday layers belong to the most prolific breeds, such as Hamburgs, Leghorns, Sicilians and the like, while those which lay every other day, belong to the more moderate layers. Yet, this is by no means solely a question of breed, for in the same breed will be found hens which lay daily, and others which lay not oftener then every other day. Occasionally a hen will lay two egg in one day, but after such a feat she usually takes a rest from laying for a day or two. The hens, like the famous "old blue," which laid one egg every day, and on Sundays laid two, are scarce, and in fact, the hens which will lay daily for seven days in a week and keep it up for several weeks at a time, are rare. Even the so called daily layers seldom lay more than five or six eggs in a week.

Spraying Solutions.—Miles Barres, Clinton Co., Pa.: There are various formulas for making spraying solutions for fruit trees and vines, their composition being varied, according to the purposes for which they are applied. If you want to spray your grapevines, to prevent the fruit being injured by what is called "black rot," make a solution as follows: Dissolve three ounces of carbonate of copper in one quart of strong spirits of ammonia, and dilute this with twenty-two gallons of water. Spray your vines as soon as the leaves have expanded in spring, and repeat every two weeks until all danger of rot has passed. To destroy insects on your apple and other fruit trees use London purple, one pound to two hundred gallons of water. The first spraying should be done when the trees are in bloom in spring, for this is the time the codlin moth deposits her eggs in the flowers.

Silver Amalgam for Mirrors.—W. Baillie, Jamaica, W. I. It is very difficult to resilver defective mirrors, but one may, possibly, be able to coat them with an amalgam of tin and quicksilver. Try a small mirror at first, and, if you succeed, extend your experiments to the larger ones. Take smooth, clean tinfoil, free from holes, and spread carefully and smoothly over a sheet of ordinary blotting or filtering paper. Then spread over the tinfoil a little of the mercury (quicksilver), rubbing it down smooth with a ball of cotton, slightly greased with tallow, until the whole surface is bright. Add more mercury, or enough to float over the entire surface of the tinfoil; then place on this a very smooth piece of paper, and then the glass, the surface of which has been previously well cleaned, is applied to the paper. The paper is then drawn out between the mercury and the glass, while a slight pressure is to be applied to the latter. As the paper is withdrawn it removes all the air between the metal and glass, allowing the quicksilver to come into contact. Your success will depend upon the perfect cleaning of the glass, and the care and skill with which you perform the operation.

To Prevent the Washing Away of Land.—Joseph Au, Cobb Co., Ga., writes us: "To keep land from washing during our wet winters, if the farmers would combine, they could easily regulate the various creeks, and prevent the washing out, by straightening the water courses and building rock walls on the lower ends just high enough to break the current of the water. By this means the land is protected against washing and the walls permit, even in freshet, the water to run over instead of washing the land. The sediment of soil behind the wall is of considerable fertilizing value."

Best Variety of Flint Corn.—L. J. Sturdevant, Fairfield Co., Conn., writes: "I want to change my variety of Flint corn. The kind I have is a copper-colored corn that I plant in hills 3½ by 3½ feet with three plants in a hill. It is a large variety and yields well, but picks very hard, owing to the large cob at the bottom of the ear. It also makes too many suckers to suit me." We have grown a good many varieties of corn during the last forty years, but do not like to recommend any particular one. A great deal depends on selection. If there is such a thing as "the best variety of Flint corn," we all want it. But, probably, there is no such thing any more than there is the best variety of wheat, barley, oats and potatoes. A variety of corn that will do best one year when the spring opens early, the summer is hot and favorable for growth, and the fall is warm and free from frost, as was the case last year, may give the worst

results in a season when all these conditions are changed. As a rule the variety that is most extensively grown for many years in any particular location is the safest variety to select. Get it from a neighbor who is known to take great pains in selecting out the best ears for seed, and who keeps it hung up in a dry place. At the same time try a small quantity of the varieties offered by some of our reliable seedsmen.

Fly Paper. Dissolving Bones.—G. A. Newhall, Knox Co., Me.: 1.—A good fly paper may be made with common thick syrup, adding one-twelfth of a pound of yellow tersulphide of arsenic, spreading the mixture upon sheets of brown paper. But such paper is dangerous to have about the house where there are children, and for this reason we prefer the following: One-fourth of an ounce of quassia chips boiled for 10 minutes in a pint of water, then add four ounces of molasses, or honey. Keep in a bottle, and, when wanted for use, put a little in a saucer or on a plate, where the flies will drink it with avidity and soon die. 2.—Dissolving large bones on a farm in the absence of bone mills, and crushers will usually prove to be a slow and unsatisfactory way of making a fertilizer. The bones may be dissolved with sulphuric acid, but if you have only a few hundred pounds, the cost of getting a carboy of the acid to your place would not prove a profitable investment. One of the best ways to utilize the bones is to dissolve in ashes. First break them up into pieces as large as hickory nuts, then pack them in alternate layers with wood ashes in an old cask, adding enough water to make all fairly moist. Leave the bones in this position until they are soft enough to be crushed up fine with a wood mallet or pounder.

Raising Calves Without Milk.—Subscriber, Salem Co., N. J.. The young calf must have new milk for the first two weeks of its life, no other food will do. After attaining that age, it may be reared on artificial food. The most successful substitute for milk is hay tea. The hay—about three pounds—is cut so as to get it into a kettle or boiler, with two and a half gallons of water and boiled half an hour. The liquor is then strained and returned to the kettle, and about a teacupful each of flaxseed and wheat middlings added. This is boiled to a jelly and fed warm. After the calf is two months old, a small handful of corn meal may be added with the flaxseed and middlings.

South Down vs. Shropshire Sheep.—O. D. B., a well-known breeder in Lancaster Co., Pa., writes us: "I want to breed some variety of the Down sheep. I cannot decide between the South Down and the Shropshire. Would you be kind enough to give your opinion to a beginner?" Our correspondent does not propose to raise the sheep for mutton and wool, but at least in part, for breeders. Popular demand has much to do with the question, and Shropshires are now very popular. A few years ago, our fashionable butchers called their fancy mutton and lamb "South Down;" now some of them talk "Shropshire." How long this will last, we do not know. If the butchers will pay as much per pound for Shropshire mutton and lamb as for South Down, we think Shropshires will be the more profitable sheep for a farmer to raise. In the London market South Down mutton commands a higher price than any other, except the small Welsh mutton. But in the manufacturing districts there is not much difference in the price, and the larger sheep, like the Shropshire, are more popular with the farmers. The real question for us to consider is which breed will best improve our common sheep. In other words, are South Down grades or Shropshire grades the most profitable for the farmer to keep? Some of our experiment stations should take hold of this question.

Wood Preservatives.—S. G. Clark, Meade Co., Kan.: Various processes and solutions have been suggested as well as used for the purpose of preventing decay in timber. Kyan—hence the general name of "Kyanizing" for such processes—used one pound of corrosive sublimate dissolved in ten gallons of water, the timber being soaked in this for several days, or until saturated. Margary, in 1837, proposed to substitute blue vitriol or carbonate of copper for the sublimate and it has been found to answer the purpose well, and is much cheaper. But to saturate a fence post by soaking in these solutions is an exceedingly slow process, and a better way is to bore a hole in the center of the post from the bottom, upward, to a point that shall be above ground when the post is in position. Then bore another hole in the post with a slight inclination downward, until it reaches the center hole. Drive a plug into the hole at the bottom of the post, then after the post is in position introduce the preservative solution through the hole in the side, and put in a plug to prevent evaporation. Common petroleum is as good a preservative as anything that has been tried, and very cheap.

Dehorning Calves.—B. Carty, Burlington Co., N. J.: Procure a stick of caustic potash or concentrated ley, and having secured the calf, find the little button on one side of its head, where the horn would grow, if allowed to. Wet the button and rub the potash on it, thoroughly, using great care not to let it touch any other place on the calf. Treat the other button in the same way, then go back to the first and repeat the operation on both buttons. That is all, but extreme care must be exercised not to let the potash touch the bare hands or clothing. It is very caustic.

Apple Trees Failing.—J. E. Groh, Lawrence Co., Mo., describes his apple trees as decaying and rotting at the roots, or at the surface of the ground. While we cannot be certain as to the cause, we will venture to say that it is a common round-headed apple-tree borer, and if you will examine the stems closely you will probably find these grubs in greater or less abundance, feeding upon the wood just under the live bark. Examine every tree carefully as soon as possible. Kill every grub you find, scrape out the rotted wood and fill the holes with wax or mortar, then wrap the stems of the trees with tar paper from three or four inches below the surface to one foot above it. We do not know that we have guessed aright as to the cause of your trees dying, but look for the grubs and if you do not find any write us again and tell us what you do find. Your peach trees may also be attacked by a very different species of borer but it can be readily destroyed in the same way as the one infesting the apple, and the trees protected with the tar paper.

Basket Willow.—H. H. Riggs, Mercer Co. N. J.: Brier or basket willow will thrive in low, wet land which is of little value, and there is always a demand for a good quality of peeled willow in our larger cities or at the willow-ware manufactories, but whether it commands a price sufficient to pay the cost of cultivation and preparing for market is quite another question. There are many men who attempted willow culture on a rather extensive scale a few years ago who soon abandoned it because they failed to get any profit out of their investment. You would do well to make some inquiries as to the cost of the imported rods before setting out a willow plantation.

Ashes, Lime, Paris Green, etc.—C. Mader, Randolph Co., W. Va.: To mix either caustic lime or hard-wood ashes with chicken or stable manure is to almost destroy their fertilizing value. If you want to compost your hen manure do it with muck or any good, rich loam, and mix and turn over the heap until it is so fine that it can be readily handled and distributed, either in the hill or in drills. Apply your ashes separate and alone in the hill if you wish and the lime broadcast on the surface, but never in the hill where it will come in direct contact with the seed. Paris green will not dissolve in water and you cannot make a "solution" of it for applying to potatoes, but you can mix it with water at the rate of a small spoonful to three or four gallons, the particles of poison being held in suspension, if frequently agitated during the application of it to the plants with a syringe or watering pot.

Old Vegetable Seeds.—Wm. Greves, Ulster Co., N. Y.: Some kinds of vegetable seeds retain their vitality under favorable conditions for a number of years while others lose it in two or three. For instance, onion seed will rarely grow when three years old, while melon seed may remain sound and good for a half dozen years. But it is not safe to depend upon old seed of any kind except after testing a sample. If you have a quantity of beet, carrot, peas and beans, three years old, test a few of each before the time arrives for making your garden, and determine just what proportion, if any, of them will grow. This can be done by sowing a few of each variety in shallow boxes or flower-pots, placing these in your kitchen or other warm room. Count the number of seeds sown and then the number of plants. The seed will sprout just as readily in pure sand as in soil only keep it constantly moist and warm. Seedsmen who are careful about sending out good seed among their patrons always test a sample of the seeds which they purchase.

About Beans.—"Tyro Gardener:" As a rule, any good, rich soil will produce a good crop of beans, provided it is not too wet, and in a climate where you can be certain of eighty days of warm weather. Beans should be planted in the spring, about the time corn is put in, but may be delayed a week or two, if more convenient. The most popular varieties for winter use, when ripe and dry, are the small or medium-sized white beans, such as the White Kidney, White Marrow, and White Wonder. The latter is a comparatively new variety, and said to be of excellent quality and very productive.

Arum Sanctum.—Frank Early, Bergen Co., N. J., is puzzled to know why the *Arum sanctum*, or Sacred Lily, so widely advertised of late by florists, is not to be found in any of the botanical works to which he has access, not even in the recently published "Dictionary of Gardening." The florists' specific name of this plant "sanctum" is a misnomer and one of those coined tricks of the trade, for the true name of this black-flowered calla is *Arum Palæstinum*, or Palestine arum, and it is very fully described under this name in the Dictionary of Gardening. Who gave it its new and incorrect name we do not know, but probably some one who preferred to be wrong rather than right.

Evergreen Hedges.—S. Edgar Whiting, Middlesex Co., Mass.: There is no better plant for an evergreen hedge than our native hemlock. Its dark green foliage is unsurpassed for richness and fresh appearance in winter, and its small, thread-like twigs gives to the surface of a well-trimmed hedge a smooth, delicate texture, such as cannot be secured with any of the spruces, pines, or arbor vitæas. The pruning should begin when the plants are first set out, and repeated annually, in spring, the amount removed depending upon the size desired for the hedge. Of course, in the management of any kind of hedge, we must allow a little of the preceding year's growth of wood to remain at the time of pruning, but one or two inches will answer with hemlock, and a hedge twenty years old need not be more than six or seven feet high, and fully as many feet in diameter at the base. If a hedge of smaller size is desired, then we would recommend some of the dwarf American arbor vitæas.

Salt for Apple Blight.—Subscriber, Centralia, Kan.: A fruit grower of your State says that a pint of salt sprinkled over the surface of the ground around either apple or pear trees will prevent blight. While we have little faith in salt as a remedy for blight, we would certainly try it if our trees were affected with this disease, or likely to be attacked. Too much salt would be injurious, but a pint scattered about a small tree, or a quart for an old or large tree, could do no harm, even if it did no good. It is well enough to try all safe and supposed-to-be remedies, for it is just possible that one may be found among the many proposed.

Width of Runners.—P. P. C., Rutland Co., Vermont: A narrow steel runner for sleighs or sleds will haul easier than a wide one. A half-round runner on ice or very hard snow will give still better results. It is for this reason that the ordinary sleigh runner is made so very narrow. But the advantage is all lost as soon as the snow becomes soft, or is deep. Then a wide runner supports the load and prevents cutting through or sinking deeply under the load. In soft snow a sled with a wide runner will often support its load and keep off the bottom when the ordinary style is cutting to the ground. A light sleigh with a three-inch runner will find good sleighing with a lighter fall of snow, and in deeper snow than any of the narrow styles. A knowledge of this fact will sometimes enable a man to do work under conditions which are usually supposed to put a stop to teaming. The reason for the narrow runners, or shoes, being in such universal use is the fact that they are best on hard, well-packed roads. Now and then, when snow is scarce or when it is too soft and deep for ordinary use, a pair of broad shoes will pay for themselves several times over.

ANIMAL AILMENTS.

Diseases of Fowls.—Preventive measures pay best in the poultry yard. Sound food of variety, cleanliness, and judicious care is indispensable. Pure water for drinking, and plenty of water for flushing the runs where fowls are confined, are essential to health. Wherever there is a well-planned hen hospital, with numerous patients, there disease prevails. It would be more profitable to put sick fowls deep under the ground. Poultry runs must be frequently changed and thoroughly cultivated, to destroy the germs of disease. This plan has kept two of the largest poultry establishments in France in perfect sanitary condition for from 40 to 60 years. There has been a substantial and health improvement in the poultry industry in the United States within the past five years.

Loss of Milk—Garget.—B. P. Lamason, Alexander Co. Va., has a valuable Jersey cow which, through neglect, was allowed to go for several days without milking, some weeks before calving. The result was garget, and the cow has never recovered from it, giving but very little milk. Such cases are nearly always hopeless. If you can afford to run the risk of getting a heifer calf from your valuable Jersey cow, with the small yield of milk, it will, perhaps, be the next best thing to making beef of her. Jersey beef, when well fattened, is of excellent quality.

Aided Parturition in Domestic Animals.—A friendly controversy between neighbors has been referred to us: That the process of maternity in the world of nature is accomplished without the interference of man is, in a large majority of cases, both certain and proper. Yet there are, doubtless, many cases where the dictates of humanity would commend assistance. There should be no sympathy for ignorant and injurious officiousness. But, from the fact that our domestic animals have become, to a considerable extent, artificial, and, to just that extent from which their systems have deviated from Nature, should human enlightenment render the aid necessary. He who feels for a poor suffering dumb brute is humane, and he who prevents or relieves the sufferings of animals is truly human.

Glanders and Farcy the Same.—Glanders is a bacterial disease, belonging, although far from exclusively, to the horse, the nose and lungs being the parts most frequently affected. Farcy is the term used for the same disease when it attacks superficial parts. It was not until 1882 that the bacterial germ or microbe that causes glanders was isolated and proved to be the sole factor in the production of the disease. This does not exclude many circumstances as being conditions that may, or may not, favor the growth of the germs. Thus, improper sanitary conditions, a depleted condition of the animal, etc., may have much to do with the development and future progress of the disease. The germ has taken the name of *Bacillus mallei*, and it may be spread by careless stablemen through watering troughs by the discharge drying upon blankets, harness, etc., and by one animal breathing the expired air of a diseased animal. A victim to the disease shows a rough coat, poor appetite, and soon ulcers appear in the nostrils. Glanders, in man, behaves in much the same way, but the acute and fatal form prevails. It is more common than is generally supposed. Ninety-five per cent. of all cases are among those who attend infected horses.

Helpless Ewe. — P. I. Lynch, Harrison Co., W. Va., has a fine flock of South Down ewes, one of which was found down in the field, without any apparent injury. It eats well, but cannot rise. With so brief a description of the case it would be impossible to tell what the trouble is when but one ewe has been thus ailing. It looks more like an injury to the back than anything else. Stable in a dry, warm place, and feed whole oats, salt liberally, and nurse.

Deposit of Coagulable Lymph in Chest of Fat Cow.—G. W. Hills, Merrick Co., Nebr. With the imperfect statement of the *post-mortem* of fat cow given, it is not possible to accurately state the cause of flat, fatty-appearing tumors on the inside of the ribs. Had the case been one of pleuro-pneumonia there would have been indurated lung or lungs containing pus. A case of tuberculosis would have shown a bad condition of nourishment of the system. But as the cow was, in appearance, both healthy and fat, it must have been, more probably, an old case of chronic pleurisy, long since cured, by pouring out lymph, which coagulated and formed the rough and irregular tumors. It was not cancer. Probably the meat was good for human food. But you were justified in giving it the benefit of a doubt by destroying it. There is a disgust that is worth respecting in all such cases in rejecting doubtful meat as human food. Such meat may properly be cooked and fed to fowls, dogs, cats, and even hogs. If still doubtful it can be converted into a fertilizer.

How to Prevent Heavy Body on Horse.—John A. Fields, Westchester Co., N. Y., desires to know how to feed a horse so that he will not become gross and heavy bodied. Feed five or six pounds of well-dusted hay at night only. If the horse does not perform long and hard labor, give two quarts of clean, sound oats three times daily, with as much wheat bran. Water three times daily, and keep a muzzle upon him when in the stable. Horses that lie down or roll in the box stall should be well bedded. Four hours' work and thorough grooming daily will keep a horse in good trim.

Elephantiasis in a Horse. — A truckman of Jersey City, N. J., asks what can be done for an enormously swelled hind leg of a horse. We regret to state that nearly all treatment in long standing cases seems only palliative. This disease is an evidence of the almost criminal negligence, of thoughtless and, too often, of careless owners of horses, the lymphatic vessels and tissues becoming readily inflamed by exposure and neglect. Repeated attacks produce the gross and unsightly leg, which becomes over burdened with deposit after deposit, until the weight of the limb becomes a perpetual burden, to be dragged by the hard-worked brute till relieved by death.

Chest Founder—Lump on Jaw.—W. E. Stratfield, Ontario, Canada, has a fine mare that has a chest founder. If treated early, there might be some relief, but in old, chronic cases but little can be done. For the lump on jaw of a colt, resulting from a blow, paint with tincture of iodine every morning for a week. Then, after a week longer, if there is no decrease, repeat the treatment. If not satisfied after the expiration of another week, apply a blister twice as large as the space covered by the lump.

Abcess of Jaw.—James G. White, Laclede Co., Mo., has a valuable brood mare that refused food and drink for a time, when an abcess formed on the jaw which broke and still discharges. The mare is in foal and in good condition. The abcess may have been caused by a bruise. Cleanse it with a dram of pure carbolic acid, dissolved in a quart of water. If not readily reached by washing, syringe thoroughly with the same fluid.

Catarrh.—George Hall, Huron Co., Mich., has several sheep that have sore eyes, which disease affects cattle and horses also. The sheep should have a quarter of a pound of Glauber's salts at night, the cattle half a pound. All should have the eyes bathed with warm water, two quarts, and pure carbolic acid one dram, night and morning. The sick animals should be put in dry, warm, darkened stables.

Nettle Rash. — Charles T. Boker, Barry Co., Mich., writes us; "I have three cows that have rough or pimply skin. They rub against everything, and are feverish. While away for two weeks my man fed pretty freely of corn meal and buckwheat bran. Could that make the trouble?" This is probably the cause of the trouble. Give half a pound of Glauber's salts, in wheat-bran slop, at night. Change feed. Feed roots once daily.

Mice, Not Rabbits.— H. B. B., Long Island: Wrapping the stems with tar paper will not protect the roots of the trees from the attacks of field mice, as you say, for these pests go undergound, in search of food, during the winter months. We have never tried scattering lime or ashes about trees, to protect them from mice, but think they might answer the purpose well if applied in the fall, first removing the weeds, grass, and sods from around the stems for a distance of about two feet. Refuse lime, from the gas works, would be preferable to fresh lime, because of its rank smell. One peck to each tree would, probably, be sufficient, and as much as would be safe to apply to trees of moderate size. Coal ashes containing all the slag and clinkers might answer equally as well as the lime, and may be applied in almost any quantity without danger of injuring the trees. You might also try mixing equal parts of coal ashes and lime, as an experiment, and determine, from experience, which answers the purpose best.

Rubbing the Tail.—Worms.—J. L. A., Esmeralda Co., Nev., has a young stallion that rubs his tail so constantly that the hair is nearly rubbed off, and looks bad. The bare spots have been washed often and sulphur ointment has been used with little success. The trouble is with the rectum. The rubbing is caused from the irritation of worms. A salt-and-water injection for a few times will probably relieve the case. If not, inject four ounces of cod-liver oil two or three times.

Scratches.—James A. Miller, Lawrence Co., Mo., has a horse that has a swollen leg from long-neglected scratches. Bathe the foot, leg, and heels with a solution of carbolic acid, a teaspoonful of carbolic acid to a pint of water, night and morning, and dress the space between the foot, behind the pastern, every night, with a compress-folded cloth, wet in copper water, an ounce of sulphate of copper to a quart of water. This is kept in place by a bandage. William Hall, Tennessee, is referred to the foregoing.

Diarrhœa and Abortion in Jersey Cow.—M. B. Merts, Madison Co., Ala., has a Jersey cow that had diarrhœa, and aborted. Had been fed cotton-seed bran, corn meal and millet hay. Information as to which of these caused the abortion is desired. As the quantity fed, and the length of time of feeding is not given, it is uncertain whether either caused the trouble. Severe diarrhœa from whatever cause may have produced the effect complained of. The excessive feeding of the foods named, may have produced the diarrhœa. The cow should be kept from breeding for a few months, and should have a change of food. The bran of cotton seed may have produced irritation of the stomach of the cow, and, by sympathy, may have caused the abortion.

Cough Affecting Milk.—N. C. Read, Alleghany Co., Ind., has a cow that appears well, has good appetite, gives a usual supply of rich milk, keeps in fine condition, but has a cough. The owner wishes to know if the milk is fit for use. A cough may come from a common cold, and unless there should supervene fever, or other derangement, the milk would be fit for use. Cure the cough by giving clean hay sprinkled with hot flaxseed tea, wheat-bran slops containing a handful of whole flaxseed morning and evening. A persevering cough where there is a decline of health in profuse milkers, should excite suspicion of tuberculosis, or some other grave affection, when the milk product would probably prove innutritious or unhealthful.

Indigestion of Ox.—Fred Funk, Snohomish Co., Washington, has an ox that eats as much as his other work oxen, yet he is dull, has a rough coat, froths on rumination, stands with head low, and four feet close together, with an arched back, and the ox is always thin in flesh. This is, undoubtedly, a case of indigestion. Give once a week, raw linseed oil, 16 ounces; oil of anise, two drams; spirits of sweet niter, two ounces. Mix and shake well and give at a draft warm from a bottle. A handful of powdered gentian and one of whole flaxseed thrown into the feed night and morning will prove a good auxiliary in effecting the cure. Another, too much neglected means of securing health in cattle, is the dressing, such as is usually given to horses. To secure and maintain health and suppleness of all the animal functions, a thorough cleaning of the skin of cattle is as essential as for that of the horse.

Injury to Stifle Joint of Cow.—C. T. J., Centralia, Va., desires advice what to do with a cow that is lame in the hind leg. There is a swelling on both the inner and outer sides of the stifle. The leg can be pulled down, so it cannot be out of joint. Apply hot vinegar night and morning, with vigorous hand-rubbing. Protect the cow from injury from the other stock by putting her in a large stall by herself. Soap liniment may be used alternately with the above.

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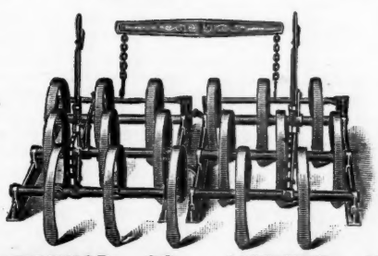

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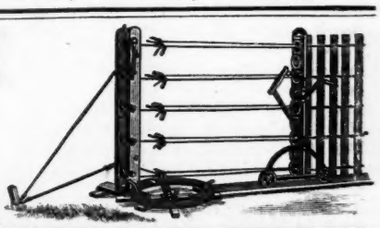

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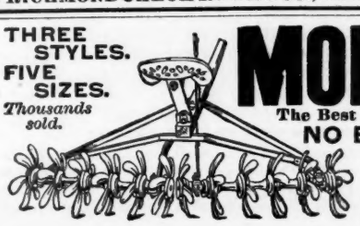

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THE AGRICULTURAL REVIEW.

The Boards of Trade Defended.

The proposed anti-option legislation is a blow at the freedom of trade in the interests of a class. To justify such a course, it should be clearly demonstrated that the evil the bill seeks to remedy,—low prices for farm product that speculation enters into—is due to the alleged cause, the dealings in future deliveries on the exchanges of the United States. That such is the cause is a pure assumption. The most eminent authority in this, or, perhaps, any country, David A. Wells, in his "Recent Economic Changes," shows that the low prices of farm products, especially grain, are due to the opening up of new lands in the Northwest, to improved farming machinery, to the invention of Bessemer steel and consequent cheaper railroad freight, and to the invention of the compound marine engine, and, hence, lower ocean freight. The increased competition of India is mainly due to the two latter causes. Are not these causes sufficient in themselves to account for the effect? Was not trading in futures in full swing during the high prices of 1881, or in the decade back of that?

The Chicago Board of Trade is a highly finished piece of machinery for moving the crops of the West. It is the result of evolution, and other organizations have taken it as a model. It performs its work at a minimum cost. Doubtless it is by no means perfect, and will be further modified from time to time as experience may suggest. It is denounced by the farmer for making bread low, and by labor unions for making bread dear. Both cannot be right. The truth seems to lie between these two. Speculation, as John Stuart Mill shows, tends to equalize prices. Of late years the tendency has been for wheat to go out of the country in May and June at lower prices than ruled in the fall and winter. It is clear, the loss fell on the trade, and not on the farmer alone. No man, who has an intimate acquaintance with the methods of trading on the Board, could come to the conclusion that there is any combination there inimical to the farmer. An operator would as soon buy as sell. Every short seller too, at some time, must be a buyer, and, when alarmed, no buyers are so regardless of price. Every seller must deliver the grain on his contract, or find some one who will.

I was on the Board some 21 years, but now have no interest there direct or indirect. If there is any sure thing in speculation, I have not discovered it, after most diligent study. Ninety-nine per cent. of all who speculate there are losers in the end. Many millions of money have been sunk there by speculators on and off the Board in "bulling wheat" in the past 10 years. B. T. Hutchinson, alone, frittered away a fortune of some five millions in speculation—money made mostly in the packing business and street railways. Where, then, does the money lost go? To pay insurance, interest and storage on the grain carried; telegraph and brokers' charges, and partly to successful speculators (a small percentage this). In my opinion, it is the farmer who gets the biggest slice of it in enhanced prices. When prices are rising, business is most active, brokers, shippers, millers and commission merchants wear smiling faces. On a bear market, not a third as many orders are received (not one-tenth would be nearer the mark). Wherein, then, is the Board a gainer, as a body, by depressing prices?

Abolish the bucket shops, where mere bets are made on the price of grain, and the farmer would be a gainer. The patrons of the bucket shops are mostly on the "bull" side; that is, are buyers. If their orders were filled on the Exchanges, such buying would tend to sustain or advance prices. As it is, untold millions are traded in at the bucket shops without affecting prices in any way. These bucket shops are mere gambling houses, and serve no good purpose. Whereas, speculation on the Board, though some of it no doubt is gambling, serves to make a constant and fairly steady market for the grain, provisions, etc., of the country. The most useful machinery may be put to a bad use. Boards of Trade are not beyond criticism, but the benefits derived from them, far outweigh the evil. The combination of Minneapolis millers is not composed of philanthropists, and, as for the exporters, they are almost invariably "bears." Great Britain is the greatest consumer of our surplus farm products, and cheap food is a necessity to the masses of her people. Are millers and exporters likely to pay more for grain in the absence of speculators? The readiness of dealers to buy corn, say for May delivery, is based on their ability to sell out at any moment during change hours to realize profits, or cut losses. The willingness of banks and capitalists to advance on cribbed corn is based on the ability to sell on the Chicago market. If "future" trading is abolished, larger margins will be required all round. Each will want more compensation for the additional risks run; hence, less will be paid to the farmer.

The Alliance last fall counseled the farmers to hold their wheat. It was dead wrong. The biggest crop, the biggest movement and the biggest foreign demand on record is the history of the crop of 1891. Without the extraordinary foreign demand, wheat would have been a drug ere this, at 65 cents a bushel in Chicago. Supposing legislation is successful in stopping trading for future delivery in the United States, Liverpool or London would probably become the center of such trade, and there prices would still be made. The cheap lands of the West are about gone, and consumption will soon catch up with production. I believe that before 1900, the farmer, who has his land clear of incumbrance, will be a much-envied man, and will ask no favors of any body.

JAMES A. HUNT, Cook Co., Illinois.

The Notable Articles of the Month.

The South for General Farming.—Soon it will be discovered, writes Gen. E. P. Alexander in the March *Forum*, that a thousand miles nearer the markets of the world than are the arable lands of the West, lies a vast territory, as fertile and as healthful as the very best of the Western lands, with vastly more resources, and with all the conditions of life greatly easier. This territorty is the South.

The interiors of all continents suffer far greater extremes of heat, cold, and drouth than lands nearer the sea. The percentage of crops lost or injured by lack of rain or by early and late frosts increases rapidly as we leave the vicinity of the ocean, which is the great equalizer of temperatures. Hence, far inland are but few fruits and vegetables that can be profitably cultivated at all, and the production even of those is more uncertain than it is nearer the coast. The farmer's chances are, therefore, fewer and poorer even for his chief crops. In comfort and economy of living, too, the farmer in the far interior suffers even more, for his vegetables are less hardy than the field crops, and his garden cannot help out the farm as it does at the South. The risk and expense of wintering stock in the South are reduced to a minimum. The winter economies and comforts in clothing and fuel, in farm work and in social life, are considerable. Nor are the summers hotter than those of the Northwest; though they last longer they are less extreme. The Southern climate is not less salubrious than that of the North, the mortality among whites in 1880 being 14.74 per 1,000 for the whole United States and 14.04 per 1,000 for the Southern States from Maryland to Louisiana, inclusive. The lands of the South are still not one-half occupied. The sole condition which now prevents a large immigration, both from abroad and from the Northwestern States, is ignorance of the situation.

The Farmer and Railway Legislation.—The railway problem will surely be solved without endangering the stability of our democratic institutions, says Prof. Henry C. Adams in the March *Century*, if the vast governmental organization (the Inter State Commerce and 38 State Commissions) created in this country in the past twenty years is permitted to develop as experience points the way, and if it is supported by enlightened public sentiment. The Granger laws of 1870 established the fact that railways are amenable to direct legislative control. But legislation by 18 States to compel competition or prevent combination, and the federal law which forbids pooling, are a class of legislation that has not met expectation. More success has been gained in the direction of securing just rates, the same to all, and not subject to frequent or arbitrary change. Railroad commissions of the Massachusetts type have direct and final jurisdiction over certain minor questions that arise, and are also intrusted with the control of all technical matters which concern the safety and convenience of the public. They are at liberty to exercise no discretion respecting general questions of transportation, their responsibility ceases with their reports to the Attorney-General, or the legislature. The States having commissions of this type are Arizona, Colorado, Connecticut, Kentucky, Maine, Michigan, New York, Ohio, Rhode Island, Vermont, Virginia and Wisconsin. Commissions of the Illinois type have certain powers that are partly administrative and partly judicial, such as to revise or alter rates, or to impose schedules of rates. They are competent to hear complaints under oath, to compel the attendance of either party to a complaint, to subpœna witnesses, and in the name of the State, to institute proceedings against the roads. The Interstate Commerce Commission is patterned after the Illinois rather than the Massachusetts type. The States whose commissions are adjusted, in the main, to the Illinois type, are Alabama, California, Georgia, Iowa, Kansas, Minnesota, Missouri, Mississippi, Nebraska, New Hampshire, North Carolina, North Dakota, Oregon, South Dakota, South Carolina, and Texas. Commissions have been established for the assessment of railway taxes in Indiana, Arkansas, New Jersey and Pennsylvania, and the last named State has made as ample provision for the collection of railway statistics as any State having a commission.

What the Department is For.—The service which the United States Department of Agriculture performs for the agricultural interests of the nation is set forth clearly by the St. Louis *Age of Steel* in an article which recommends a corresponding department of commerce. It says: "What we want is a market. It is true that we have a chance with the rest of the world, but it is also true that we have the rest of the world to compete with in the marts of commerce. To do this the best information and the wisest methods are necessary. These can neither be secured nor directed at haphazard, or by desultory efforts. The waste in blind and ill-advised energy more than covers its gains. Main force and 'elbow grease' are not the only desiderata in business, and knowledge is power as much in commerce as it is in managing a steamboat or a locomotive. We have a modern example of this in the agricultural industries of the nation. It was not without its wise men, or its facts, and the mass of its constituents have been in deplorable ignorance or in helpless knowledge of their possibilities and blunders. The Department of Agriculture evolutionized out of this chaotic condition, and its record for usefulness is beyond challenge or controversy. Such a departure is needed now in commerce."

A State Road System.—As bad roads force people to live in cities, and good roads tend to take them out into the country, Col. Albert A. Pope, of bicycle fame, outlines in the March *Forum* a plan for a State system of roads. He would have each State establish a bureau for disseminating information as to roads, their expense, construction and all manner of knowledge about them. Then he would have some kind of State supervision and advisory assistance by a State engineer, or engineers appointed by the State in aid of road and bridge building upon scientific principles and upon a comprehensive and economical plan for the whole State. He would have the State own or control and maintain some through highways. The expense of this scheme of road betterment he would have the State divide in the tax levy, so that part should be apportioned to the whole State, part to the counties through which the roads ran, and part to the towns. By borrowing on long loans this tax might be kept small. There need be no objection to this plan, he says, on the part of those who desire to work out their taxes on the roads, for they could still do so upon the town roads tributary to the main roads. Towns would have no occasion for jealousy of interference or encroachment of outside authority, having their own roads to themselves. Taxation, in the aggregate, would not be increased, because the expense of the general or through roads would be provided for by loans, and would be distributed to the counties and the State, the more populous neighborhoods and wealthy people paying most of the tax. The AMERICAN AGRICULTURIST directs attention to the excellent suggestion that a fund for building such roads be obtained by a five per cent. tax on all inheritances exceeding $10,000 in amount, thus making "dead tax dodgers pay for good roads."

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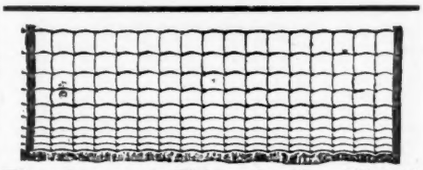

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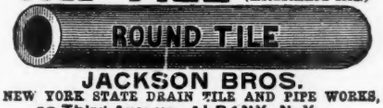

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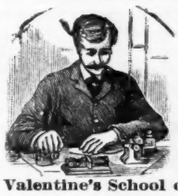

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MATTERS OF BUSINESS.

The Distribution of Wheat.

The March report of the statistician of the Department of Agriculture puts the stock of wheat in growers' hands at 171,000,000 bushels, or 28 per cent. of the crop, 63,000,000 being spring and 108,000,000 winter wheat. The largest reserve previously reported was 169,000,000 bushels in 1885, when our exports of wheat, and flour reduced to wheat, amounted only to 132,000,000 bushels for the year ending June 30, 1885. For the eight months of the present fiscal year, up to February 29, 1892, our exports of wheat have been 164,000,000 bushels, or 32,000,000 bushels more than during the whole season of 1884-85, when the largest previous reserve stock was reported.

With visible supplies now of 41,000,000 bushels of wheat, and invisible supplies of 171,000,000 bushels, a total of 212,000,000 bushels, it is well to look at our requirements. Taking the figures of the Department we find the annual domestic consumption placed at 300,000,000 bushels, of which fully one-third will yet be needed. Annual requirements for seed are 56,000,000 bushels, of which 36,000,000 bushels were absorbed by fall seeding, leaving 20,000,000 bushels still needed for summer wheat sowing. These two domestic sources demand 120,000,000 bushels, leaving, of the apparent supply, some 88,000,000 bushels for export.

All estimates, on both sides of the Atlantic, agree that, in addition to present stocks, the shortage in England and Europe is such as to require imports of at least 7,000,000 bushels of wheat, weekly, or 140,000,000 bushels before the harvesting of the next crop. Receipts from Australia, Argentine, India and South America are not expected to exceed 50,000,000 bushels, owing to the shortage in the yields of the new crop in all these countries. This leaves 90,000,000 bushels to be supplied by Canada and the United States, of which Canada cannot afford more than 5,000,000 bushels. Thus we have:

Requirements.	*Bushels.*
Home consumption to June 30, 1892	100,000,000
For seed to June 30, 1892	20,000,000
European demand from United States	85,000,000
Total demand	205,000,000

These figures are believed to be extremely conservative, the supply to be derived from Canada being, in fact, 1,000,000 bushels more than is estimated by other authorities—and the actual European demand being in excess of 7,000,000 bushels weekly. With a total visible and invisible supply of 212,000,000 bushels on March 1, we have actual requirements for 205,000,000 bushels, leaving a surplus of but 7,000,000 bushels, if the Department is correct, which is only one week's European supply, and may easily be absorbed there.

In spite of the fact that one-third of the previous year's crop was on hand March 1, 1885, No. 2 spring wheat sold that month in Chicago for from 74 to 80 cents; in April the range of prices advanced from 78 to 92 cents, in May, 86 to 91, and June, 85 to 90 cents. If the market continued steady and advancing with 169,000,000 bushels on hand then, and no extraordinary demand for export, may we not look for a like future now with a supply but slightly more and a foreign want notoriously greater than then? How much influence will it have on the market that the estimated quantity of corn on hand is over 300,000,000 bushels more than in March, 1885? Our oat crop was 155,000,000 bushels greater than six years ago, and the supply of oats now on hand is, perhaps, increased in equal proportion. Will domestic or foreign consumption prefer corn to wheat? Will the new wheat crop in India and the Southern Hemisphere thresh out a larger surplus than was expected? How will the spring wheat crop of the United States and Europe come to maturity? These questions, as well as the deficit in Europe's present supplies, must all be considered in estimating the future of the wheat market.

Wheat Crop of the World.

"In compiling an estimate of the world's wheat crop for 1891, official statements for the different countries have been used wherever available. In many cases these official estimates (marked by an asterisk) are preliminary, and likely to be considerably changed by the final statement. The figures not marked by the star are commercial estimates. The crop of the world, as far as reported, is 2,238,245,081 bushels. The crop of 1890 for exactly the same countries, similarly compiled last March, was 2,203,889,552 bushels." Thus reads the March report of the United States Department of Agriculture. It adds that Bulgaria is reported for the first time, 40,022,976 bushels; also Caucasia, in Asia, 37,023,375, a total of over 77,000,000 bushels, which are omitted in the following comparison prepared from the present and previous reports of the Department:

WINCHESTER BUSHELS OF SIXTY POUNDS.

	1891.	1890.	1889.
North America:			
United States *	611,780,000	399,262,000	490,560,000
Canada:			
Ontario *	33,611,074	25,262,000	19,288,983
Manitoba *	23,922,598	14,000,000	11,928,511
Total	669,313,672	438,493,412	521,777,494
South America:			
Argentine Rep.	33,069,000	41,703,683	11,350,000
Chili	14,187,500	18,567,360	12,768,750
Total	47,256,500	60,271,043	24,118,750
Europe:			
Austria	41,143,750	51,440,667	42,000,000
Hungary *	126,268,750	165,345,000	94,020,333
Belgium	14,187,500	19,573,075	19,000,000
Denmark	3,713,472	5,776,512	5,000,000
France *	232,360,236	338,902,124	316,268,369
Germany *	126,253,563	94,899,840	82,000,000
Great Britain *	74,400,714	75,666,617	75,576,383
Ireland *	2,615,437	2,639,399	2,680,838
Greece	5,675,000	12,378,240	5,000,000
Italy *	126,254,563	126,610,746	103,832,354
Netherlands	3,713,472	6,189,120	5,675,000
Portugal	8,252,160	8,252,160	8,512,500
Roumania	53,073,684	63,954,240	44,784,853
Russia *	169,108,708	197,739,200	188,535,989
Poland *	12,680,920	22,343,125	
Servia	7,945,000	10,315,200	5,000,000
Spain	71,349,094	70,143,360	75,622,213
Sweden *	4,551,350	3,956,043	3,708,045
Norway	412,698	412,608	283,750
Switzerland *	4,041,766	2,475,648	2,270,000
Turkey	33,008,640	37,134,720	39,725,000
Total	1,121,558,740	1,316,177,644	1,119,495,627
Asia:			
India *	255,434,667	235,345,600	243,076,549
Asia Minor	37,029,375	37,134,720	36,887,500
Persia	20,630,400	22,693,440	22,500,000
Syria	12,343,125	12,378,240	12,768,750
Total	325,437,567	307,552,000	315,232,799
Africa:			
Algeria	21,281,250	22,693,440	22,500,000
Cape Colony	4,126,080	3,713,472	3,800,000
Egypt	11,140,416	8,252,160	7,945,000
Tunis	4,256,250	4,256,250	
Total	40,803,996	38,915,322	34,245,000
Australasia: *	33,874,606	42,480,131	26,205,957
Grand Total.	2,238,245,081	2,203,889,552	2,041,075,627

The Position of Corn.

The quantity of corn in farmers' hands, on March 1st, is estimated by the Department of Agriculture at 860,000,000 bushels, being 41.8 per cent. of the crop of 1891. This amount has only once been exceeded—in 1889—when it was 45.9 per cent., or 970,000,000 bushels. The merchantable proportion is the largest ever reported, being 88.5 per cent., or 761 against 834 million bushels, and 85.7 per cent. two years ago, compared with an average of 82 per cent. for eight previous crops, as follows:

March 1.	*Product of Previous Year.*	*On hand March 1.*	*Per Cent.*	*Consumed or distributed.*
	Bushels.	*Bushels.*		*Bushels.*
1883	1,617,000,000	587,000,000	36.3	1,030,000,000
1884	1,551,000,000	512,000,000	33	1,039,000,000
1885	1,795,000,000	675,000,000	37.6	1,120,000,000
1886	1,936,000,000	773,000,000	39.9	1,163,000,000
1887	1,665,000,000	603,000,000	36.2	1,062,000,000
1888	1,456,000,000	508,000,000	34.9	948,000,000
1889	1,988,000,000	787,000,000	39.6	1,201,000,000
1890	2,113,000,000	970,000,000	45.9	1,143,000,000
1891	1,490,000,000	542,000,000	36.4	948,000,000
1892	2,060,000,000	860,000,000	41.8	1,200,000,000

The exports of corn for the year ending June 30, 1890, were over 103 million bushels, and for the following year only 32 millions. But, since July 1, 1891, to March 1, 1892, a period of eight months only, the exports have been 48,412,643 bushels. For the months of January and February of the present year the exports were almost 30,000,000 bushels. The outlook now is for further exports of 75 million bushels by the end of October, when the new crop is harvested, compared with exports of 63 millions in the like period to November 1, 1890. This would reduce the supply of merchantable corn for home consumption to some 685 millions. The total supply is thus nearly 100 million bushels *less* than at this time two years ago, following the still unprecented crop of 1889, and only 260 millions *more* than last year, following the heavy shortage in the crop of 1890.

But the supplies for commerce are drawn, almost exclusively, from seven States, Ohio, Indiana, Illinois, Iowa, Missouri, Kansas, and Nebraska, which have on hand 546 million bushels, or 41½ per cent. of their product. The Department reports that about 24 per cent. of the crop in the Western States is available for distribution beyond county lines, indicating that the corn surplus States can now spare only 131 out of their 546 millions, compared with some 46 out of 290 millions in March last year, and 146 out of 667 millions on March 1, 1890.

The average farm price for the present merchantable crop is 39.2 cents per bushel, against 58 cents a year ago, and 28 cents two years ago. The Chicago price for No. 2 cash corn ranged from 28 to 30 cents in March, 1890, April 29 to 33, May and June 33 to 35, and thereafter advanced as the shortage in the growing crop became apparent. Now, (March 12th) Chicago prices are about on a par with the farm price above reported.

Agricultural, Personal, and Commercial.

Smoke Your Meats.—Read the advertisement of E. Krauser & Co.'s "Liquid Extract of Smoke" on page 296.

Every Farmer Needs to save time and expense. In the breaking of a rein, a trace, or a belt, the use of Thomson's slotted clinch rivets saves both time and money.

Music Hath Charms when played, near and far, on the Washburn, Marquette, or the Lakeside, guitar. Free catalogue sent by the manufacturers, Lyon & Healy, Chicago, Ill.

Fine Prize Poultry were exhibited, last fall, by our advertiser, Charles Gammerdinger, of Columbus, O. He has over fifty varieties, and, with 400 birds, won over 800 first and second premiums, besides display prizes.

A Spray Pump Free is not obtainable every day, although it is an absolute necessity on every farm. Our readers can learn about a good one by sending 10 cents postage to A. B. Spiers, Box 67, North Windham, Me.

Bees.—Send your name for free samples of bee veils, comb foundation, advice to beginners and circulars of bee book, smokers, etc., or send *eight* 1c *stamps* for a 24-p pamphlet on *Taming and Handling Bees.* Dadant & Son, Hamilton, Illinois.

A Buggy Free is an offer not made every day, but our readers can learn how to get one by studying the offer of the Foster Buggy & Cart Co., Cincinnati, O., who believe in small profits and quick returns. Send for their illustrated catalogue and prices.

Large Crops of Fruit necessitate the use of evaporators, so as to preserve the surplus in marketable condition for later in the season. The Zimmerman Evaporators are well-known standard machines, made by the Blymyer Iron Works Co., Cincinnati, Ohio.

To Remove Curbs, Splints, spavins, windpuffs, and all bunches, try Quinn's ointment a trial package of which will be sent to readers of this monthly magazine who forward four cents in stamps to W. B. Eddy & Co., Whitehall, Washington Co., N. Y.

Advancement of Ability is shown in the case of Mr. T. Stevens, who was, for eight years, with the Goulds & Caldwell Co., manufacturers of windmills and other farm machinery, at Chicago, and has now been admitted to an interest in, and elected secretary of, the company.

The 'Cycle of the Age is the best that can be obtained for the least money, and those who make a specialty of dealing in second-hand 'cycles are Rouse, Hazard & Co., Peoria, Ill. Their stock is large, prices low, and terms made to suit everybody, even time instalments. Send for their catalogue and price-list.

The Terrors of Monday can be avoided by the housewife who uses Gold Dust washing powder. It saves a deal of time and labor, doing away with all the rubbing and scrubbing that make washday so dreaded. It is just as useful and saving in all household work, and has the further advantage of keeping the hands soft.

Spray Your Trees and Vines, if you want good fruit and plenty. Spraying pays, for it gives fruit free from worms, scab, or rust. Readers of the AMERICAN AGRICULTURIST can obtain, free, a book on "Spraying Fruits — How, When, and Where to do It," by sending their addresses to William Stahl, Quincy, Ill.

850,000.—This is the number of grapevines in over 100 varieties offered by Lewis Roesch, Fredonia, N. Y. Vines from this nursery have been sent to every State in the Union, and have everywhere given satisfaction. The catalogue of this firm, which is brimful of valuable information to grape and fruit growers, will be sent free to all applicants.

A Good Idea and its Result is the man-weight cultivator, propelled by the force of the worker, as he walks through his fields. The work is light, easy, and pleasant, and thoroughly effective, com-

(*Continued on Page* 274.)

"MURRAY" **BETTER than GOLD** "MURRAY"

There are not many things that are as good or equal in value to Gold and VERY FEW that are BETTER THAN GOLD. It is however a known fact that there are thousands of owners of our world renowned "Murray" Buggies and Harness all over the continent, who say, they would not give up their "Murray" Buggies and Harness for their value in gold if they knew that they could not get another of the same kind. Our

MURRAY $55.95 BUGGIES and $5.95 HARNESS

are known the world over and are justly recognized as the BEST and CHEAPEST Vehicles and Harness on the market. We sell direct to the consumer at prices beyond competition and belong to neither the Buggy or Harness Pool or Trust.

Do you wish to purchase a Buggy or Harness this year? If so, and you want value received for your money and something BETTER THAN GOLD, there is but one make to buy and that is the celebrated "MURRAY."

Many Firms Make Big Claims, BUT WE PROVE OUR WORDS BY DEEDS AND WILL WAGER **$1000** (One Thousand Dollars), with any Carriage or Harness Firm in the U. S., same to be given to any Charitable institution by the loser, that we can show more honest and better testimonials for the "MURRAY" Buggies and Harness for the time our goods have been on the market, than any one Factory in the World

Write for our large Illustrated Catalogue, containing full description and prices of our "MURRAY" Vehicles and Harness. We will mail it to you FREE. Address all letters to

"MURRAY" **THE WILBER H. MURRAY MFG. CO., CINCINNATI, O.** "MURRAY"

MURRAY BUILDING.

SEEDS NORTHERN GROWN, BEST FOR ALL SOILS & CLIMES. 60,000 - BUS. POTATOES CHEAP SEND 8¢ FOR 10 FARM SEED SAMPLES, OR 5¢ FOR FINE CATALOGUE - OR 13¢ FOR BOTH JOHN A. SALZER LA CROSSE WIS.

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Pulverizes the Finest. Easiest in draft. Most Rapid in work. **Over 8000 in Actual Use** Sold on its merits. **Valuable improvements for 1892.** Write for circulars to KEMP & BURPEE MFG. CO., Syracuse, N. Y.

45 sold in '88
2,288 sold in '89
6,268 sold in '90
20,049 sold in '91
60,000 will be sold in '92

A Steel Windmill and Steel Tower every 3 minutes.

☞ These figures tell the story of the ever-growing, ever-going, everlasting Steel Aermotor. Where one goes others follow, and we "take the country."

Though sold, we were unable to make all of the 20,049 Aermotors in '91. Orders often waited 8 weeks to be filled, but now we have vastly increased our plant and are prepared promptly to plant our increase in every habitable portion of the globe.

Are you curious to know how the **Aermotor Co.** in the 4th year of its existence, came to make **many times as many windmills as all other makers combined?** How we came to originate the Steel Wheel, the Steel Fixed Tower, the Steel Tilting Tower?

1st. We commenced in a field in which there had been no *improvement for 25 years*, and in which there seemed no talent or ambition, and none has yet been shown except in *feeble* **imitation of our inventions.**

2d. Before commencing the manufacture, exhaustive scientific investigation and experiments were made by a skilled mechanical engineer, in which over 5,000 dynamometric tests were made on 61 different forms of wheels, propelled by artificial and therefore uniform wind, which settled definitely many questions relating to the proper speed of wheel, the best form, angle, curvature and amount of sail surface, the resistance of air to rotation, obstructions in the wheel, such as heavy wooden arms, obstructions before the wheel, as in the vaneless mill, and many other more abstruse, though not less important questions. **These investigations proved that the power of the best wind wheels could be doubled, and the AERMOTOR daily demonstrates it has been done.**

3d. To the liberal policy of the Aermotor Co., that guarantees its goods satisfactory or pays freight both ways, and to the enormous output of its factory which enables it to furnish the best article at less than the poorest is sold for. For '92 we furnish the **most perfect bearings** ever put in a windmill, and have made an **exhaustive revision of the Aermotor and Towers.**

If you want a strong, stiff, Steel **Fixed** Tower—or if you want the tower you don't have to climb (the Steel **Tilting** Tower) and the Wheel that runs when all others stand still that costs you less than wood and lasts ten times as long (The Steel Aermotor) or if you want a Geared Aermotor to churn, grind, cut feed, pump water, turn grindstone and saw wood, that does the work of 4 horses at the cost of one ($100), write for copiously illustrated printed matter, showing every conceivable phase of windmill construction and work, to the **AERMOTOR CO.** 12th and Rockwell Sts., Chicago, or 12 Main St., San Francisco.

GALVANIZED It is not enough to make portions of leaves exposed edges and is not so good as painting. The Steel Aermotor is entirely galvanized after being punched. Thus **all parts are completely protected** from rust and decay.

The Aermotor Pneumatic Water Supply System enables you to supply every part of your house with water without an Elevated Tank.

The "WONDER ON WHEELS." NO POLE. **SOLID COMFORT** SELF GUIDING. TONGUELESS.

Two Horses instead of Three.

Wood or Steel Beam.

A 10-year old boy instead of a plowman. Uses a wheel landside. No side draft. No neck weight. No lifting at corners. Brake prevents plow running on team.

Easier Driving, Straighter Furrows, and **Lighter Draft** than any plow on or off wheels. Equally adapted to Western prairies and hard, stony ground, or hillsides.

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Special prices and time for trial given on first orders from points where we have no Agents.

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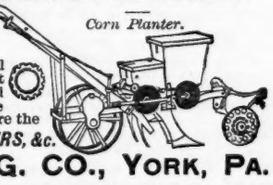
Single Row Distributor.

WE MAKE A SPECIALTY of manufacturing **ALL KINDS** of Fertilizer Distributors, both broadcast and single row. We have **Two Styles** of **SINGLE ROW** Fertilizer Distributors, one with an **EXTRA Capacity** which will **sow 50 bush. Cotton Seed per acre.** These machines fully meet the requirements of Truckers, Cotton, Tobacco, Orange Growers and Farmers, and we **WARRANT** them to be the most **complete and Perfect Force Feeds in existence.** We also manufacture the *SPANGLER IMPROVED CORN SHELLERS, FODDER CUTTERS, &c.*



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LEADS THEM ALL

Sample mailed X C for Nickel $1.50. **$1.00** Stallion Bits 50 cents *extra.*

RACINE MALLEABLE IRON CO. RACINE, WIS. J. P. Davies, Mgr.

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FRAMES (3 sizes) fitted by ANY ONE to any shoe. Calks only wear. Anyone can put in new. Set $3. ex. pd. For single sets send shoe size.

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$5 A DAY SURE. $2.15 Samples free. Horse owners buy 1 to 6. 20 other specialties. E. E. BREWSTER, Holly, Mich.

HAND MADE NICKEL TRIMMED, $12 Single Strap Harness. —Write for Illustrated Catalogue.— THOMPSON, The Harness Man, Ridge Farm, Ill.

CARDS! New Sample book 2c. U. S. CARD CO., Cadiz, O.

MATTERS OF BUSINESS.

(*Continued from Page 272.*)

pared with the ordinary hand cultivator. It is a money-making and money-saving machine, and every farmer should send for a catalogue, to J. A. Everitt Seed Co., Indianapolis, Ind.

A Perfect Buggy-Top has long been wanted, and seems now supplied by the Kemper Mfg. Co., of Cincinnati, O. The front bow is a straight, tubular socket, fastened two-thirds of the way to the top, on the second bow, and ingress and egress are had with the utmost ease. Free catalogues can be had by our readers who apply to the advertisers.

The Ever Reliable and well known AMERICAN AGRICULTURIST is, in many respects, the greatest journal devoted to farm affairs published in this or any other country. Its illustrations are always finely executed and attractive, and its reading matter well written and carefully edited. In this respect its anniversary number is a marvel; but, for that matter, so is every issue.—[*Orange County Farmer.*

The Annual Calendar, issued for 1892, by Henry A. Dreer, 714 Chestnut street, Philadelphia, surpasses all previous efforts of this house. Setting aside its handsome cover, its interior will be found replete with a fund of information, useful to the gardener and agriculturist. Truck, field, fruit, and flower seeds, causes of failures, rotation of crops, hotbeds, and cold frames, with directions to correspondents, are all amply set forth and should be in the hands of all our readers.

Roofing for Farm Buildings.—There are few questions which, from a financial standpoint, are of as much importance to farmers as how to roof farm buildings in an economical, and yet thorough, manner. These facts are ably discussed in the new catalogue of the Philip Carey Mfg. Co., 117-125 Gilbert avenue, Cincinnati, Ohio. This firm manufactures various grades of roofing suitable for all classes of buildings. It furnishes these materials direct to farmers, at special prices, and forwards samples, as well as catalogues, to all who apply for them, if this paper is mentioned.

Frozen Meat.—The imports of frozen meat into the United Kingdom represent from fifteen to twenty per cent. of its total consumption of mutton. The number of carcasses of mutton imported in the past three years were as follows:

From	1889.	1890.	1891.
Australia	85,547	207,984	334,693
New Zealand	1,068,286	1,533,391	1,896,706
Falkland Islands		10,168	18,897
River Platte	1,009,936	1,196,531	1,073,325
Totals	2,163,769	2,948,074	3,323,621

The Low Price of Potatoes, during the past season, will naturally turn the attention of farmers to any machinery or contrivances that tend to properly perform the necessary labor with economy in expense. The triumph of modern invention, in this direction, is the Aspinwall Potato planter, which marks the row, opens the furrow, drops and covers the seed, at any desired depth, all at a single operation. It will plant from three to nine acres daily, and can also be used for corn planting. It has a fertilizer attachment. The machine is made by the Aspinwall Mfg. Co., Three Rivers, Mich.

What They Say of It.—Thousands of farmers throughout the United States are applying to the AMERICAN AGRICULTURIST for its outfit to aid in the work of securing from Congress a just law to prevent speculation in fictitious farm products. Hundreds of these letters are accompanied by words of earnest commendation, encouragement and suggestion. R. C. Justice, Faulkland, Del., says: "The work of the AMERICAN AGRICULTURIST should strike a death blow to those who gamble at the farmer's expense." S. M. Wyman, Pomona, Ga.: "This is a measure of vital importance to the moral and financial prosperity of not only the producers but all classes of our countrymen." A. O. Yates, Oretown, Oregon: "I heartily indorse the plan." J. M. Dauser, Sayreville, N. J.; "I fully approve of the position taken and of the plan suggested, and will do my part to see this abomination brought to an end."

Irrigation in Idaho is practiced on 4,323 farms out of a total of 6,654. The total area of land upon which crops were raised by irrigation in the census year ending May 31, 1890, was 217,005 acres. The average size of the irrigated farms, or, more strictly, of irrigated portions of farms on which crops were raised, is fifty acres. The average first cost of water right is $4.74 per acre, and the average cost of preparing the soil for cultivation, including the purchase price of the land but excluding the cost of water right, is $10.56 per acre. The average present value of the irrigated land of the State, including buildings, etc., is reported as $46.50 per acre, showing an apparent profit, less cost of buildings, of $31.20 per acre. The average annual cost of water is $0.80 per acre, which, deducted from the average annual value of products per acre, leaves an average annual return of $12.13 per acre. The tendency throughout the entire arid region to describe as irrigated

(*Continued on Page 275.*)

Give the Girls a Chance!
To be GOOD NATURED.

GOLD DUST
Washing
Powder

MEANS:
The washing all done early in the forenoon.
No scrubbing; no backaches; no tattered tempers.
Monday a quiet, orderly and proper day, instead of the horror of the whole week.

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A Good Better Best BUGGY FOR $55.00 OR $65.00 OR $75.00

BUY of the *Manufacturer*. SAVE *Middleman's profit and Traveling man's expenses.* We manufacture a full line of **Buggies, Phaetons, Surreys, Carriages,** and **Carts.** Send for Catalogue and Price List. *All Vehicles warranted.* PIONEER BUGGY CO., Columbus, Ohio.

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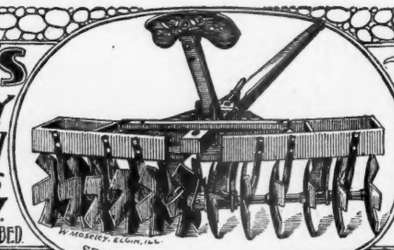
The oldest in the World. Ask your dealer for it and if he does not handle it, address us for samples, prices, etc,
THE CANTON STEEL ROOFING CO., Canton, Ohio.

THE CLARK'S CUTAWAY HARROW SUPERSEDES THE PLOW.
MAKES A PERFECT SEED BED.



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POTATO-PLANTER

PLANTS Corn, Beans, Ensilage, Etc., Etc.

DISTRIBUTES FERTILIZERS.

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Illustrated Circular sent Free. (*Mention this paper.*)

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Did you ever plant Seeds and then wait sadly for the green leaves that never came? **BURPEE'S SEEDS** are not that kind; you plant them; **they grow.** That's one reason why our mail order Seed Business is the largest. There is nothing doubtful about **BURPEE'S SEEDS;** their strong vitality is tested before selling, while having all been grown from the **most thoroughbred strains** they are equally sure to delight the planter with the Choicest Vegetables and most Beautiful Flowers. If you appreciate quality in Seeds, write to-day for **Burpee's Farm Annual for 1892.**

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D. M. FERRY & CO., Detroit, Mich.

MATTERS OF BUSINESS

(*Continued from Page* 274.)

all land to which water has been applied within any recent period by artificial means, land to which ditches, perhaps so far destitute of water, have been constructed, and even land for which water rights merely are claimed, has placed the Census Office under the necessity of absolutely restricting itself in its official bulletins on irrigation to land on which crops were actually raised by the artificial application of water during the year 1889. The farms or stock ranches in Idaho irrigated merely for grazing purposes have therefore not been taken into account in Census bulletin 157.

Cheaper Binding Twine.—A Belfast, Ire., company is preparing to manufacture binding twine on an enormous scale, "the recent reduction of the import duty having enabled the British manufacturers to compete successfully with United States makers." In view of the attempt of the National Cordage Co. to monopolize the market and compel farmers to pay extortionate prices for binding twine, this departure excites great interest. Several important American manufacturers, also refuse to go into the trust, while others are starting up, and it looks as though the National could not maintain extravagant prices.

Selling in the English Markets.—Edgeley, La Moure Co., N. D.: If English wheat is given in quarters, you should multiply by 28 to reduce to pounds, and divide by 60 to get bushels. If in hundred weight multiply by 112 and divide. If centals, add 00 and divide by 60. To-day, March 15, No. 1 wheat is quoted at Liverpool at a price equivalent to $1.05 per bushel of 60 pounds. A table showing freight rates from Atlantic points to Europe, also from Chicago to Liverpool through freight, is given in each issue of *Farm and Home*, published at Springfield, Mass. The present rate on grain, New York to Liverpool, is 5½ cents per bushel, Chicago to Liverpool, 20 cents. You should arrange at point of shipment with the railroad to deliver at ship's side, and insurance can best be effected there by yourself.

A New Way to Pack Apples.—A London house writes to Australia saying that Australian fruit growers have beaten not only English growers, but also American, in the packing and delivery of green fruit for the London market. American and Canadian fruit growers send apples, usually packed in barrels, and not so carefully selected or packed as Australian fruit. These are shipped in light, strong, ventilated boxes, each holding one bushel, or sometimes one-half bushel. They have the advantage of being easily handled, and with less risk of spoiling or rotting from overheating. Moreover, if a case be lost or broken, it is not so serious as the loss or breakage of a barrel holding three times as much. Americans must do something in this direction to stop the heavy waste and loss that has marked our apple export trade this season.

The Farmers' Standard Guide is the AMERICAN AGRICULTURIST. For half a century it has "led the way" where successful farmers have found it profitable to follow, and has been a household word in hundreds of thousands of happy and prosperous homes in this favored land. It has each year been better than the former year, and now it has reached an epoch in its history that is well marked by a number of greater excellence and interest than any that has ever preceded it. It is a number that every reader of this leading agricultural paper will be glad to have, but while it is, in itself well worth having, far better is it to have in the home each number of the AMERICAN AGRICULTURIST for the new year, as it is issued, to read, to study and to bring amusement and useful knowledge to the members of the household. No periodical is of more value to the farmer, the horticulturist or the stock raiser. The good old AMERICAN AGRICULTURIST is the one that can least be spared from the library table.—[*New Jersey Journal.*

A Welcome Visitor.—The AMERICAN AGRICULTURIST is always a welcome visitor at our house. We could not get along without it.

P. C. LARSEN, Cache Co., Utah.

THE "MEXICAN PRIMROSE."

THE CHARMING MEXICAN PRIMROSE is the Grandest of all New Plants. It is strictly a perpetual bloomer, as it is in flower at all times of the year, a good specimen showing always from ten to thirty large saucer-shaped blossoms, about three inches across, of a beautiful, bright, clear pink color, veined with scarlet and with a white center. The superb color, combined with airy grace and beautiful form, goes to make a flower which is in beauty perfection itself. Each blossom keeps perfect many days before fading, and when it drops, others are out to take its place, and this succession of beauty is continued from one year's end to another. The plant is a free grower, succeeding in any soil or situation. As a window plant it combines great hardiness and ease of culture with unsurpassed beauty and delicate loveliness, and is truly a plant which has no superior. In the open ground it grows freely and blooms profusely all summer, and, in fact, until winter is upon it. Early frosts do not injure it, and it blooms on until frozen solid or covered with snow. It is a plant whose merits of hardiness, ease of culture, perpetual freedom of bloom, and unsurpassed beauty, both in color and habit, are offset by no faults whatever. It is the one most desirable new plant for the whole world. **FINE PLANTS, ALL READY to BLOOM, by MAIL POSTPAID, GUARANTEED to Arrive in Good Condition, 40 cts. each, 3 for $1, 7 for $2. Those ordering three or more plants may have a Manettia Vine free by asking for it.**

THE TRUE MANETTIA VINE The most magnificent flowering vine in cultivation, and is loaded with brilliant flowers every day in the year. The fame of its marvelous beauty is world wide. Fine plants **ALREADY BUDDED AND BLOOMING, 25 cents each, 3 for 50 cents.**

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SPECIAL OFFER For 60 cts. we will send by mail one plant each of Mexican Primrose, Manettia Vine and pk't Peacock Pansy. Two of each for $1.

Also the Following Extra Choice Collections by Mail Postpaid.

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4 Lovely Tea Roses, white, pink, yellow and scarlet 50c	6 Pkts. each rare new Flower, and Vegetable seeds 50c

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STRAWBERRIES. —Bubach, Haverland, Felton, Pearl and other choice varieties at very low rates. Grape vines, fruit and ornamental trees. Price list free. **S. C. DE COU,** Moorestown, Bur. Co., N. J.

The Recognized Breeds.

Only such animals will be admitted free into the United States after April 1, 1892, for breeding purposes, as can show ancestors of record for five generations on the side of the sire and four on the dam's side. Otherwise, the animal will be dutiable. The books of record recognized by the Treasury Department include the whole list on Page 86 of the current volume of the AMERICAN AGRICULTURIST, and also the following: Horses — Stud Book Francais of Thoroughbreds, American trotting register, Shire Horse stud book of Canada, Clydesdale stud book of Canada, Cleveland Bay stud book (French draft), Stud Book des Cheveaux de Trait Francais, Boulonnais (French) stud book, Nivernais (France) stud book, French Coach government certificate, Oldenburger stud book, Hanoverian government certificate, Stud Book de Societe National des Eleveurs Belges (Belgium draft), stud book of the Barb race (Algeria); while of the Arabs the recognized breeds (attested by a sheik's certificate) are Kehilan, Hamdani, Seglawi, Abeyan and Managhi. The jacks and jennets of France are recognized, if recorded in the Stud Book des Animaux de l'Espece Mulassiere, Race Cheveline et Race Asinine. In cattle, the foreign records recognized, in addition to those named on Page 86, are: American Shorthorn herd book for Canada Shorthorns, Jersey herd book of Great Britain, Brittany herd book of France (Herd Book de la Race Bretonne Pie-noire), Friesian herd book (Fteisch Rundvee Stamboek), Brown Swiss, Switzerland, Oldenburg and Jeverland, herd book of Germany. Of sheep, the Cheviot and Dorset flock books are recognized. The above, with the foreign registers printed on Page 86, thus form a complete list of breeds with a recognized system of registry for breeding improved blood. All the American sheep and swine registers on Pages 86 and 87 are officially recognized, and also the Standard Delaine Merino register, American Southdown record, register of Cheviot Society of America, register of the Dorset Horn Society of America, and the 57 breeds of dogs in the American Kennel Club stud book.

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One quart will sow a plot 15 x 20 (300 square feet), or for an acre 5 bushels will be required.
Price, 30c. per Quart (free by mail), or by express or freight, buyer paying charges, 25c. per Quart; $1.50 per Peck; $5.00 per Bushel.
WITH EVERY ORDER FROM THIS ADVERTISEMENT is also sent **Free** our **Catalogue of Everything for the Garden** (which alone costs us 25 cents), provided you will state where you saw this advertisement. Our Catalogue of 150 pages is bound in illuminated covers, and is the largest ever issued. It is replete with many engravings and colored plates of all that is new and desirable in **Seeds** and **Plants.**
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150,000 PEACH TREES FOR SALE. Besides this we have an enormous stock of every variety of Fruit and Shade Trees, Vines, Plants, etc., best quality, in any quantity, at prices that defy competition. No Yellows, no contagious diseases. Catalogue and best terms free to all readers of this paper Address
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CHOICE SEED POTATOES! 300 Bushels, the best varieties, our own growing. **32-Page Catalogue Free.**
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New Markets for Forest Products.

A large class of agricultural produce which will be benefited by the commercial agreements negotiated with Southern countries includes rosin, turpentine, tar, pitch, lumber of all kinds, and manufactures of wood. All these products of American forests have been subject to duties in Brazil, the Spanish West Indies and San Domingo. Nearly all are now on the free lists, and their increased importation into the countries named will follow, as a matter of course.

The agreement with Brazil has already been in force long enough to offer a fair indication of the general trend of the export trade under the new conditions of commercial union. From April 1st to September 1, 1890, the exports from the United States to Brazil amounted to $5,133,590. During the same period of five months in 1891, covered by reciprocity, these exports were $6,303,182, an increase of $1,169,592. There was an increase in every class of agricultural produce, although the largest gain was in machinery and steam engines. There was an additional export of turpentine and rosin and a gain of $214,290 in lumber and manufactures of wood.

Rosin, pitch, tar and turpentine have been relieved in Brazil of a duty of fifteen per cent. when exported from the United States. The total imports have amounted to $167,963, and the larger share, $98,310, has been shipped from the United States. In Cuba and Porto Rico the duties before the recent increase of twenty-five per cent. on all imports were ninety cents per 220 pounds on rosin and pitch, and one and three-fourths cents per pound on crude turpentine. All are now free of duty when exported from the United States. The same articles have been placed on the free list with similar reductions of duty in consequence of diplomatic action with San Domingo.

The Uses. — While these products of various species of pines are largely used in caulking the seams of ships, and are comprised under the head of naval stores, they enter also into numerous mechanical processes. The bulk of the rosin of commerce is supplied from North America, and is an ingredient in varnishes, cheap candles, soap, lubricating oils, printers' ink, fireworks, plasters and ointments. Pitch and tar, which are used in various manufactures, are supplied not only from North America, but also from Finland, the Black Forest, Austria and Switzerland. The volatile oils distilled from turpentine are manufactured largely in Europe as well as in the United States. The Scotch fir, the maritime pine of Southern Europe, the silver and spruce firs of Germany and the Hungarian larch furnish competing products which reduce the exportation of American turpentine, derived mainly from the long-leaved pine of the Carolinas and the balm of Gilead fir of Maine. As the manufactures in which rosin and turpentine are used have not been established in Brazil and the Spanish West Indies, there is a restricted demand for the crude articles, chiefly in the form of naval stores.

A More Important Class of forest products affected is comprised under the head of wood and its manufactures. Importations of this class into the Spanish West Indies from the United States have amounted to $1,057,659, including $560,787 in lumber, $342,393 in barrel staves, headings and hoops, and $154,479 in boxes. This aggregate excludes importations of doors, windows, shutters, wagons, carts and other manufactures of wood, which amount to about $500,000 annually. The United States practically has no competition from Europe in this trade, France and Germany having between them barely more than $50,000 out of a total of over $1,500,000.

The duties on these exports from the United States have been high. On pine boards and scantlings the old rate per 1,000 feet was $4.80; on poplar boards, $7.20; on maple and cedar, $9.60; on walnut, $12; and on planed lumber twenty-five per cent. has been added. Hard and unhewn timber has been subject to a duty of $7.20; materials for cooperage have been taxed from $2.16 to $5.16 per 1,000, and hogshead and barrel headings and shooks from fifteen to twenty-six and two-thirds cents. A uniform increase of twenty-five per cent. on all these duties was decreed by the Spanish government before the commercial agreement was negotiated.

Under the reciprocity arrangements all these duties have been removed since September 1, 1891.

(*Continued on Page* 278.)

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The beautiful Early Norther heads the list of new kinds. New Queen, Harbinger, Minister, and all the good kinds, new and old, are in it.

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1892.

1892.

"SURVIVAL OF THE FITTEST."

If Darwin's theory is to be accepted, then the fact that I am the sole survivor in the trade of those who began with me the same line of business, gives significance to the fact that my sales of seed to market gardeners, well known to be the most critical of all buyers, has increased year by year until it has now reached vast proportions. That I raise many varieties on my five seed farms, make 1,700 tests annually for vitality, and test novelties, that no one may be imposed on, will explain much to the thoughtful buyer. I invite you to write for my **FREE** Vegetable and Flower Seed Catalogue

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STRAWBERRY PLANTS by mail, 300 of 4 kinds, early to late, **only $1.** By Ex. per 1,000, $1 and up. Best plants and packing. Price list *free.* All berry plants. **SLAYMAKER & SON, Dover, Del.**

EGGS 13 for $1.00, S. C. Leghorns, R. C. Brown Leghorns, Silver Wyandottes Light Brahmas, Pekin Ducks. Send for circular. You can order direct from this and eggs will be sent promptly. **Al. P. ALLEN,** Meadville, Pa.

New Markets for Forest Products.

(*Continued from Page 277.*)

The free lists now include woods of all kinds in trunks or logs, joists, rafters, planks, beams, boards and flooring; staves, headings and hoops for cooperage; boxes mounted or unmounted; wagons and carts, doors, frames, windows, shutters and houses. All manufactures of wood, turned or unturned, painted or varnished, will be free after July 1, 1892, with the exception of furniture of all kinds, on which there will be a reduction of fifty per cent. from the current rates. The only reservation made for the protection of Cuban forest products is in the form of cedar boxes, which are excepted from the operation of the free lists.

The effect of these sweeping reductions in increasing American export trade can only be roughly estimated in the absence of statistics. The sugar product of Cuba and Porto Rico is now reported to have reached 800,000 tons during the last season, an increase of 200,000 tons in a single year. There have been large investments of American capital in the island during the last year, and every steamer sailing for Havana and Cienfuegos is now carrying improved plants and machinery for milling cane and extracting an increased percentage of the juice. Unless all signs fail, there will be, during the next five years, an enormous development of the cane-sugar industry of the Spanish West Indies. This will involve an equally large increase in the demand for cooperage materials of all kinds.

The improvement in milling facilities also renders necessary a larger use of lumber, and the marked reduction in the cost of building and framing materials will have the effect of increasing the demand. The advantages of the larger market for wood and its manufactures will be shared by Canada with the United States until July 1, 1892, when all the other Spanish commercial treaties will be abrogated. The permanent arrangement with the United States will then go into effect, and Canada will be excluded from the benefits unless the British government succeed in the meantime in negotiating a similar convention. The only exceptions to the free list of wood and its manufactures after that date will be cedar boxes, furniture, carriages, railway and street cars and a few articles of fine wood. On these there will be reductions of duties amounting to fifty per cent. for furniture and twenty-five per cent. for carriages. Cars for railways will be subject to an *ad valorem* duty of one per cent.

In San Domingo, the commercial agreement provides for the free introduction of wood and lumber for building purposes, for cooperage of all kinds, materials for shipbuilding, boats and lighters and school furniture. It also sanctions a reduction of twenty-five per cent. in all other manufactures of wood, including furniture, implements of household use and woodenware. The entries in the free list cover an export trade from the United States amounting to $135,000 and those in the reduced schedule to $25,000. As the duties have been very high—sixty per cent. on lumber and manufactures of wood—the doubling of this trade may be confidently expected in a short period. In both the Spanish and the San Domingo treaties trees, shrubs, and tan bark are included in the free schedules.

Not so Good in Brazil.—The commercial arrangement with Brazil is less favorable in its conditions respecting lumber and manufactures of wood than the other two conventions. Railway construction, material and equipment is alone included in the free list, but a reduction of twenty-five per cent. is provided for in lumber, timber, cooperage, furniture, wagons, carts, carriages and other manufactures of wood. Under this heading the imports received from Europe have been $1,098,927 against $417,761 from the United States.

The reduced schedules will place a premium upon American lumber and manufactures of wood, and ought naturally to involve a substantial increase of the export trade. The importations of engines and machinery have amounted to $184,652 from the United States and $2,320,627 from Europe with duties ranging from fifteen to forty-eight per cent. After the negotiation of the commercial agreement there was in the course of five months an increase amounting to $1,000,000 in importations of this class received from the United States.

[*Continued on Page 279.*]

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SPECIAL OFFER! To any lady answering this advertisement *and naming the paper in which she saw it,* we will send *free,* in addition to all the above, one packet of the new and popular *imported* **Love-in-a-Mist,** a hardy, erect-growing annual, with bright green fennel-shaped leaves, finely cut, and bearing a very pretty and curious blue flower. Plants grow about 12 inches high, are of the easiest culture, and very profuse bloomers. We will also send *free* one copy of our **Manual of Floriculture,** a book of great interest and value to all who cultivate flowers.

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New Markets for Forest Products.

(*Continued From Page* 278.)

The effect of the removal of the duties was felt almost at once in favoring American at the expense of English machinery. A similar result may follow the reduction of duties on lumber and manufactures of wood.

Agricultural Implements and Machinery are on the free lists of the three conventions. The advantage offered in Brazil over European competitors is slight as the port and provincial charges have not exceeded five per cent. so that little progress is to be anticipated in this class of exports. In San Domingo duties amounting to sixty per cent. have been removed and a new market has been opened for agricultural machinery and implements. In Cuba also there ought to be a substantial gain in trade.

Notwithstanding the marked superiority of American farming tools their introduction has been attended with great difficulty in Southern countries. In Mexico and the Argentine Republic improved machinery of this class is gradually coming into use, but in Brazil, Peru, Colombia, Venezuela, and Central America primitive implements of agriculture are still employed. A great drawback upon the successful introduction of these implements and machines is the absence of American wholesale houses in Southern cities where they can be seen and purchased. In Pernambuco, Bahia and Rio there are English warehouses carrying everything of this kind in stock. There are no American houses conducted on this basis on that coast. Commercial union without mercantile energy will be of little avail in introducing manufactures of this kind.

That "Danger of a Water Monopoly," described in the AMERICAN AGRICULTURIST for February, Page 142, is not as serious a question as it appears in that article. Supposing congress should grant to Colorado and Wyoming the control of the water, and these States should build storage reservoirs, will that prevent the water from running into its accustomed subterranean channels, thence into gulches, creeks, rivers and ocean? The more land there is irrigated at the base of the mountains, the more rainfall there will be to the east of it. Not a drop of water is lost; ravines and gulches, which were as dry as a bone 10 years ago, now have running water the whole year. It is impossible to erect reservoirs of sufficient capacity to store, in any one season, the one-thousandth part of the entire flow of water from the melting snows. The farmers of those States mentioned, depending on water for irrigating purposes, may rest easy. In the event that such storage reservoirs are built, and all available basins on the plains are filled, the creeks and rivers flowing through their respective States will not dry up. On the contrary, inundations at one time, and shortage of water at another, will hardly ever occur; the flow will not only be as large as before the settlement of Colorado and Wyoming, but be more uniform during all seasons.

ADOLF DONATH, Larimer Co., Col.

Education in Great Britain.—In England, public grants of money are made to collegiate institutions, fixed agricultural schools, lectures, and to temporary classes for special technical teaching, such as dairying, fruit growing and forestry. During the past fiscal year nearly $25,000 was distributed to twenty-nine institutions, of which $10,000 was used for dairy teaching. In Scotland, forestry is especially studied, while in England more time and money are devoted to fruit growing and horticulture. On one farm of 253 acres, thirty being arable and the remainder pasture, were between fifty and sixty cows. The dairy was twenty by eighteen feet and thirteen and a half feet high. The floor was of concrete and the walls were tiled. In the scullery adjoining was a steam cheese-making apparatus. The cheese room communicated directly with the dairy, was heated by a stove and had room for 150 cheeses. A young woman gave instruction, and the fee for a four week's course, including board and lodging was $40. Between May and October there were ninety-two students. Cheese making began at seven o'clock every morning, and the average price realized for the cheese was fourteen cents per pound.

It Leads the Agricultural Press.—The AMERICAN AGRICULTURIST easily leads the agricultural press of this country.

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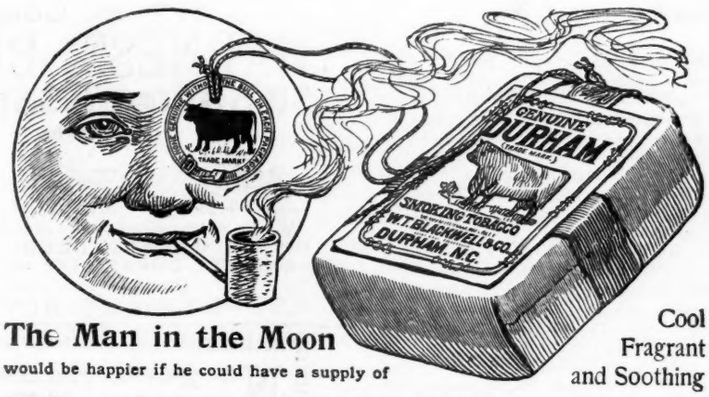

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The Situation of Wool.

During the past twenty years the price of wool in London has steadily declined from $130 per bale in 1872 to $65 per bale at the present time, a decrease of exactly 100 per cent. The American market for domestic Merino wool shows an almost identical decline, Boston paying an average of 64 cents per pound for fine Ohio wool in 1872, and 33 cents for last year. The reason for this enormous loss in wool values is due simply and solely to the increased production of the raw material. Great Britain's import of Colonial wools was 743,000 bales in 1872, and its own clip 378,571, or a total of 1,121,571 bales; last year, Colonial imports were 2,005,000, domestic product 352,381, total supply, 2,357,381, exclusive of minor imports. The United States imported the equivalent of 92,000 bales (of 420 pounds each) in 1872, when our domestic product was 388,500 bales, total 480,500 bales; last year's imports were 284,000, domestic clip 721,400, total 1,005,400 bales.

The supply of both countries more than doubled in the period that prices declined one-half.

The development of wool production is better emphasized by the following table, giving the increase in sheep for five years past in the Australian colonies, which are the greatest producers of wool in the world. For the sake of comparison we also present the statistics of sheep in the United States for the same periods (for sheep by States, see Page 250 of this number), 000's being omitted:

Year.	*Australia.*	*New Zealand*	*Total Colonies*	*United States.*
1887.....	69,675	16,565	86,240	43,545
1888.....	81,216	16,677	97,893	42,599
1889.....	81,459	16,677	98,136	44,336
1890.....	85,809	16,116	101,925	43,419
1891.....	97,879	16,750	114,629	44,938

The enormous total of 114,000,000 of sheep in the colonies compares with 50,000,000 in 1870, and only 20,000,000 in 1860. To these totals must be added the number of sheep in the Argentine Republic, 66,000,000, in Cape Colony 20,000,000, and in the United Kingdom 34,000,000, in all Europe 168,000,000, in South America 101,000,000, in North America over 50,000,000, in Asia 36,000,000, and in Africa, 29,000,000, making the world's aggregate certainly not less than 500,000,000 of sheep. At an average of six pounds of wool per sheep, this gives an annual world's supply of wool of at least 3,000,000,000 pounds worth at the rate of three pounds of wool per dollar, $1,000,000,000. The bulk of this enormous product finds its way to the English markets as may be seen from the following table of English imports for the past three years:

From	1891, *bales.*	1890, *bales.*	1889, *bales.*
Australasia.....	1,380,963	1,226,172	1,238,679
The Cape.....	316,510	283,494	287,334
Germany.....	3,335	4,592	7,358
Spain and Portugal	8,941	13,538	21,558
East India.....	104,310	103,342	113,518
Persia.....	29,457	22,328	27,350
Russia.....	96,205	65,506	106,263
River Plate.....	9,145	6,310	11,885
Chili and Peru.....	30,328	30,059	32,410
Alpaca	31,740	27,441	34,637
Mediterranean.....	64,795	74,237	88,395
Mohair.....	62,993	48,131	77,526
Sundry.....	47,433	36,736	44,981
Total Imports.....	2,186,155	1,941,886	2,091,894
Domestic Clips...	352,381	328,572	316,667
Total British Consumption and Exports, in bales....	2,538,536	2,270,458	2,408,561

In connection with these woolen imports and manufactures, it is of interest to look at comparative figures regarding the same industry in our own country, and we accordingly present both the production and imports of raw material for five years past in the United States:

Year.	*Product in lbs.*	*Imports in lbs.*
1870.....	163,000,000	38,634,000
1880.....	264,000,000	99,372,000
1887.....	333,500,000	114,404,173
1888.....	322,300,000	97,231,277
1889.....	295,778,479	126,181,274
1890.....	309,474,856	109,902,103
1891.....	303,401,507	119,390,280

These figures show a decrease in the present production of American wool as compared with five years ago, and a slight gain in imports. The present year, 1892 will no doubt show a much larger comparative increase in imports, purchases of Australian wools to date being heavier than at any previous time, due to the existing cheapness of the Australian clip. In this connection it is of

(*Continued on Page* 281.)

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HARNESS $5.50 and upward. | BUGGIES $55.00 and upward. | Road Carts $11.50 and upward.

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Broadway and 11th St.,
NEW YORK.

When writing to advertisers, be sure and mention the AMERICAN AGRICULTURIST.

The Situation of Wool.

(*Continued from Page* 280.)

interest to note that, notwithstanding the enormous excess of woolen manufactures in Great Britain, as compared with the United States, the average annual *per capita* consumption of wool is but seven pounds there, as compared with nine and one-quarter pounds in this country. This shows that the English use more shoddy in the bulk of their manufactures, especially of cheap goods, while the American has a better quality of goods. It is this use of shoddy, which has grown so fast, that has also had a marked influence in depressing prices during the past four years. Even the Ways and Means Committee of Congress admit this, and emphasize the point that shoddy equivalent to 20 per cent. of the United States wool product was used in this country last year.

The AMERICAN AGRICULTURIST believes that the price of wool is at bedrock, or certainly cannot fall many points lower. The supply is not likely to increase as rapidly in the future as in the past, for the business is not now as profitable as heretofore. Moreover, according to the regular cycle of seasons, the time is approaching for a drouth in Australia. The last drouth there killed 12,000,000 sheep, and that the next one, which Australians themselves are expecting, will be even more disastrous is evident from the fact that the number of sheep has increased so enormously without any increase in the water supply, either natural or artificial. We believe the present season will see a tendency to increased values in the price of wool, the more especially as stocks throughout Europe are comparatively light, the heavy receipts of 1891 having been fully absorbed. Stocks in the United States are also less than at this date four years ago, when prices reached so low an ebb. We append a full line of quotations at Boston, the great wool market of the country, showing the values now ruling. Freight on wool from the Pacific Coast to New York is one and one-half cents per pound, from Texas to Boston about the same, from Colorado and Nebraska one to one and one-fourth cents, and from Chicago about three-fourths of a cent. Wool is carried from Liverpool to Boston for seven to nine cents per 100 pounds.

PRICES OF WOOL AT BOSTON ON MARCH 14TH.

Ohio and Pennsylvania:		Spring, Northern,	
XXX	31@32c	free, 6 to 8 mos.	55@56c
XX	—@29c	Southern, 12 mos.	56@58c
X	27½@28c	" 6 to 8 mos.	50@53c
No. 1	36@—c	Fall, free	45@50c
No. 2	33@—c	" defective	35@40c
Fine unwashed	20@21c	Oregon (Scoured basis):	
Unmerchantable	22½@23c	Eastern, No. 1	55@57c
Ohio combing:		" No. 2	53@54c
No. 1, ⅝ & ½ blood	37@38c	Valley, No. 1	50@52c
No. 2, ½ blood	34@35c	" No. 2	48@50c
Ohio delaine	32@33c	Montana (Scoured basis):	
Michigan:		Fine	58@60c
X and above	25½@26c	Fine medium	55@57c
No. 1	33@34c	Medium	—@52c
No. 2	32@—c	Wyoming & Utah (Scoured basis):	
Fine unwashed	19@—c	Fine	55@57c
Unmerchantable	21@—c	Fine medium	55@—c
Michigan combing:		Medium	50@52c
No. 1, ⅝ & ½ blood	—@36c	Colorado & New Mexico:	
No. 2, ½ blood	34@—c	Improved	16@18c
Mich. delaine	—@31c	Coarse and carpet	15@16c
Kentucky, Indiana & Mo.		Georgia & Southern	27@28c
Combing, ⅝ blood	27@28c	Pulled wools (Scoured basis):	
" ½ "	26@27½c	Extra	58@62c
" Braid	23@—c	A super	50@53c
Clothing, ⅝ blood	27@28c	B supers	42@45c
" ½ "	25@26c	Low B's	40@—c
" Coarse	23@—c	C's	30@35c
Texas (Scoured basis):		Combing	42@45c
Spring, fine, 12 mos	58@60c	Fine combing	50@53c
" 6 to 8 mos.	55@56c	California, finest	62@65c
" med. 12 mos.	53@—c	" second	58@60c
" 6 to 8 mos.	50@52c	Western, extra	53@55c
Fall, fine	50@53c	" super	40@45c
" medium	45@48c	" low	20@25c
California (Scoured basis)			
Spring, Northern, free, 12 mos	—@58c		

Pleasure and Profit.—In renewing my subscription, I should be ungrateful if I did not mention the pleasure and profit I have derived from the AMERICAN AGRICULTURIST. It is certainly growing better from year to year.

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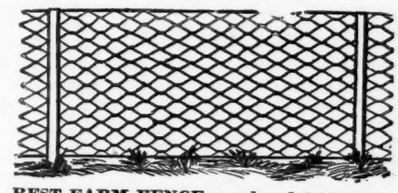

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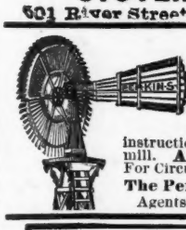

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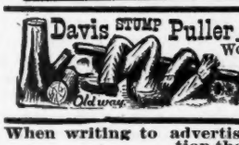

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Book Reviews.

THE SUGAR BEET, including a History of the Beet Sugar Industry in Europe, varieties of the sugar beet, examination, soils, tillage, seeds and sowing, yield and cost of cultivation, harvesting, transportation, conversation, feeding qualities of the beet and of the pulp, etc. By Lewis S. Ware, C. E., M. E., Fellow of L'Ecole Centrale des Arts, Agriculture et Manufactures, Paris; Member of the American Chemical Society. Illustrated by ninety engravings; large octavo, pp 324, Philadelphia: Henry Carey Baird & Co.; New York: The Orange Judd Co. Price, $4.00 postpaid.

The author predicted, many years ago, that the growth and manufacture of beet sugar would be established upon a firm and enduring foundation in this country, and he was right. Anticipating this time he prepared a highly interesting and exhaustive work upon the subject, beginning with a history of the fluctuations of the industry in Europe, and its then condition in America, the attempts made here, and the results that would follow its permanent establishment on a large scale. He then describes the different varieties of the sugar beet and their examination, and the general consideration of soils. What is of more practical value to the farmer follows in the chapters on the preparation of the soil, tillage, desirable manures and fertilizers, seeds, sowing and transplanting, harvesting, yield and cost of cultivation, and its value as a rotation crop. The work concludes with a description of the insects and diseases that are inimical to the successful growth of the sugar beet, and finally a valuable chapter showing the feeding qualities of the pulp, and in what proportion this should be fed to the different kinds of live stock. Take it all in all, this is an exceedingly valuable work, both for the capitalist and manufacturer, as well as for the farmer, and especially so at the present juncture when the beet sugar industry is attracting so much general attention. This volume, which is profusely illustrated with sketches and explanatory diagrams, should be in the hands of every progressive agriculturist in the country.

THE HYGIENIC TREATMENT OF CONSUMPTION.—By M. L. Holbrook, M. D., Professor of Hygiene in the New York Medical College and Hospital for Women; Editor of the Herald of Health. Published by M. L. Holbrook & Co., New York. Cloth, 12mo, pp. 219.

Important as hygienic remedies are in all diseases, in none are they more so than in consumption. To advocate the treatment of this terrible disease by hygienic means accessible to all has been the author's object in writing this book. The nature and causes of the disease, prevention and treatment in its earlier stages, and treatment in more advanced stages are successively treated in the three parts of the work. At even a hasty glance over the pages, the reader becomes at once impressed by the fact that the author is thoroughly master of his subject, and that he has made a careful study of the entire field up to the very latest discoveries and researches of Koch, Virchow and others. There is a wonderful amount of solid common-sense talk in this book, not only on consumption, but on the importance of the observance of hygienic laws in other diseases, and in the walks of everyday life as well. We feel quite sure that if this book could be placed in the hands of every person, not naturally blessed with a vigorous constitution, health and happiness would enter into many a home where there is now sickness and despair. Sold by the Orange Judd Co. Price, $2.00.

GRASSES OF THE SOUTHWEST: Plates and descriptions of the grasses of the desert region of Western Texas, New Mexico, Arizona and Southern California. By Dr. George Vasey, Department of Agriculture, Washington. Government Printing Office, 1891.

This is Vol. 1 of a series illustrating North American grasses on which the Division of Botany has lavished much careful work. The book is entirely devoted to a botanical description of the plates it contains, and is published for the use of libraries, colleges, experiment stations and the like. The work is almost wholly original and is a monument to Dr. Vasey's scientific accuracy. It is the first publication of results in the experimental work inaugurated by the Department of Agriculture to increase the production of grasses and forage plants in the arid region. Many of the grasses are short lived, springing up suddenly after the summer rains and maturing quickly. Others have deep roots, thus enabling them to withstand long and continuous drouths. The descriptions given are mostly technical but the accompanying illustrations afford a means of quick recognition. This volume treats of some of the more interesting and common grasses only, but a second volume is in preparation giving an equal number of plates, 50, after which it is proposed to publish an analytical synopsis of all the grasses of the desert region.

MONEY, SILVER AND FINANCE. By J. Howard Cowperthwait; pp. 242, octavo. New York and London: G. P. Putnam's Sons. 1892.

This book contains a brief but comprehensive view of the silver question in its bearing on American affairs. It is notable for the force with which the author shows why he believes this nation has no profitable use for any more legal tender money paper or silver. He is a gold standard advocate of the most advanced type, condemns the existing silver law and free coinage, and explains with force what he considers the fallacy of the balance-of-trade and volume-of-money theories. This work is the best and clearest popular statement of its side of the complex question. Sold by The Orange Judd Co. Price $1.00.

Useful Publications Received.

FROM THE UNITED STATES DEPARTMENT OF AGRICULTURE.

During January and February.

Sixth and seventh annual reports of the Bureau of Animal Industry for the years 1889 and 1890. (Department allotment now exhausted, four-fifths of the edition being reserved for the use of the Senate and House.)

Statistical Report No. 91 on the crops of the year and on freight rates of transportation companies, with European crop report for December, and articles on farm prices, distribution of spring and winter wheat, cotton imports of the United States, the canning industry and agriculture in Uruguay and in the Guianas.

Statistical Report No. 92, upon the numbers and values of farm animals, and on freight rates of transportation companies, with notes on European crop prospects for February, foreign agriculture, and new railroad construction in 1891.

Chemical Bulletin No. 31. Proceedings of the eighth annual convention of the Association of Official Agricultural Chemists held in Washington, D. C., August 13-15, 1891. Methods of analysis of commercial fertilizers, foods and feeding stuffs, dairy products, fermented liquors and sugars.

Insect Life, Vol. 4, Nos. 5 and 6 (double number).

Experiment Station Record, Vol. 3. Nos. 5 and 6.

Contributions from the United States National Herbarium, Vol. 3, No. 1.

Farmers' Bulletin No. 5. Treatment of smuts of oats and wheat; No. 6. Tobacco: instructions for its cultivation and curing.

Miscellaneous Bulletin No. 2 of the Division of Statistics, treats of agricultural resources of the Argentine Republic, Bolivia, Brazil, Chili, Columbia, Ecuador, the three Guianas, Peru, Uruguay and Venezuela. The fact that our imports from South America largely exceed our exports to these countries is generally well understood, but that the greater proportion of our imports consists of

(*Continued to Page* 283.)

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Our Library Corner.

(*Continued from Page* 282.)

agricultural products, while a very small proportion of our exports are the products of our soil is not, perhaps, so well appreciated. An introductory chapter presents considerable information in regard to the present conditions of trade with the countries in question, and the bulletin is designed as a useful corollary to the reciprocity treaties recently effected with some of them, and as an aid in the development of these trade relations, especially in so far as our agricultural products are concerned.

Miscellaneous Bulletin No. 3 reviews the work of the coöperative credit associations in certain countries of continental Europe, with reference especially to the agricultural industry, including the German credit unions or "people's banks;" the Raiffeisen loan associations; German legislation on coöperative associations; the people's banks of Austria-Hungary; coöperative banking in Italy; rural coöperative banks in Russia.

FROM THE EXPERIMENT STATIONS.

ALABAMA—Exp. Sta. at Auburn, Bul. No. 30, November, 1891, apples, pears, peaches and plums; Bul. No. 31. November, 1891. Irish and sweet potatoes; Bul. No. 32, November, 1891, corn, wheat, and oats; Canebrake Exp. Sta., Bul. No. 13, December, 1891, corn.

CALIFORNIA—Exp. Sta. at Berkley, annual report, 1890; Bul. No. 96, January, 1892, sulphuring in fruit drying, fig trees at the experiment stations, notes on Persian palms.

DELAWARE—Exp. Sta. at Newark, third annual report, 1890; Bul. No. 9, creamery studies of methods and machinery, creameries as a business.

ILLINOIS—Exp. Sta. at Champaign, Bul. No. 18, November. 1891, dairying experiments.

IOWA—Exp. Sta. at Ames, Bul. No. 15, November, 1891. sugar beets, injurious insects, soiling experiment, time of sowing grass seed, winter wheat, best varieties of oats, fertilizers.

LOUISIANA—Exp. Sta. at Audubon Park, Bul. No. 13, second series, sweet potatoes.

MAINE—Exp. Sta. at Orono, annual report, 1891, part 1.

MARYLAND—Exp. Sta. at College Park, Bul. No. 8, March, 1890, some feeding trials; Bul. No. 12, March, 1891, pig feeding.

MASSACHUSETTS—Exp. Sta. at Amherst, circular, January, 1892, analyses of concentrated feeding stuffs and commercial fertilizers; Hatch Exp. Sta. at Amherst; meteorological Bul. No. 37, January, 1892.

MICHIGAN—Exp. Sta. at Agricultural College, Bul. No. 80, January, 1892, fruits.

NEW YORK—Cornell Exp. Sta. at Ithaca, Bul. No. 37, December, 1891, sundry investigations made during the year.

NORTH CAROLINA—Exp. Sta. at Raleigh. Bul. No. 81, December 15, 1891, feeding cotton-seed hulls and meal for the production of beef.

NORTH DAKOTA—Exp. Sta. at Fargo, Bul. No. 3, October, 1891, diseases of sheep; Bul. No. 4, December, 1891, potato scab and possibilities of prevention, a disease of beets identical with deep scab of potatoes, hastening the maturity of potatoes.

OHIO—Exp. Sta. at Columbus, Bul. Vol. IV, No. 9, December, 1891, the apple scab, spraying of orchards.

PENNSYLVANIA—Exp. Sta. at State College, Bul. No. 18, January, 1892. notes on new and old varieties of orchard fruits and small fruits.

SOUTH CAROLINA—Exp. Sta. at Fort Hill, fourth annual report, 1891.

TEXAS—Exp. Sta. at College Station, Bul. No. 18, October, 1891, liver flukes; Bul. No. 18, December, 1801, corn fodder.

UTAH—Exp. Sta. at Ogden, second annual report, 1891.

VIRGINIA—Exp. Sta. at Blacksburg, annual report, 1891; Bul. No. 11, October, 1891, vegetables.

WASHINGTON—Exp. Sta. at Pullman, Bul. No. 1, December, 1891, announcements.

WEST VIRGINIA—Exp. Sta. at Morgantown, Bul. No. 18, September, 1891, commercial fertilizers;

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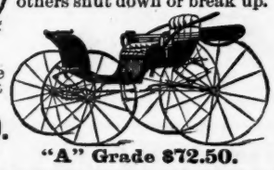

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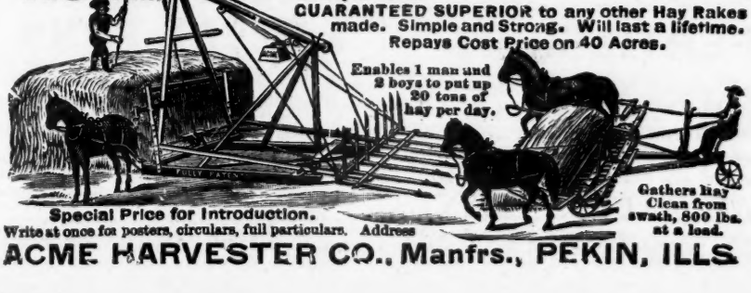

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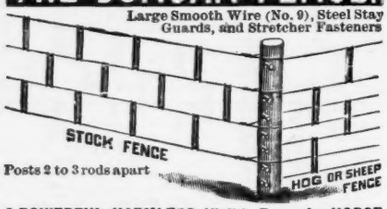

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Two Important Questions.

Railroad Stock - Watering. — The frequent charges of extortion preferred against Western railroads have given to Thomas L. Greene the text for a discourse in the *Political Science Quarterly* of recent date, under the caption "Railroad Stock-Watering." Mr. Greene answers the arguments sometimes advanced by legislators, that first or original cost should alone be considered in speaking of adequate returns upon the investment, by showing that the cost of the plant may soon equal, if not exceed, the total first capitalization (bonds and stock), owing to growth and improvements. The cost of railroads in Kansas averages not more than $21,000 per mile, while the net returns in 1890 upon this cost amounted to four and one-fourth per cent., leaving the stock out of the account. It is impossible for a railway to increase its profits steadily and markedly except through the carriage of a large traffic at gradually falling rates. Such an increase of property as may allow profits on unpaid-for stock can come only by a growth of business, accompanied by a decrease in the charges per transportation unit, and roads cheaply built must have additional capital in order to accommodate increased traffic.

The reasonable return upon original cost should still further make allowance for the annual increase in values, common to all other industries. The average value of improved farm land in central Illinois increased thirty per cent. between 1880 and 1890. Farm lands in Kansas have increased greatly in value since 1880. Judged by the standard of profit around them, the railroads of Illinois, Kansas, and other Western States could now be paying higher dividends than in 1880 without subjecting themselves to a just complaint because of that fact alone. The increment in railroad values is not unearned, a large portion being created commercially by the building and operation of the railroad, in furnishing means of transportation, and thereby giving land its value.

Brazil Cannot Compete in Cotton.—Though Brazil began to export cotton more than a hundred years before the United States, her annual product to-day is only about one-eighteenth as much as our own, says Dr. John C. Brauner, in the March *Popular Science Monthly.* To be sure, the population is only one-fifth as large as ours, but there almost the whole population lives in a cotton-growing region while only a small part of our people live in the cotton belt. Under normal conditions Brazil can scarcely become a competitor of the United States in cotton production; but the disappearance of slavery and the consequent adoption of some system of small farming will, in the near future, materially increase the present production. Slavery has fostered a remarkable conservatism in agriculture, which must, with the aid of educated planters, soon disappear. Cotton factories are already springing up and prospering, and the day is not far distant when they will supply the Brazilian market.

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SYKES IRON & STEEL ROOFING CO. NILES, O., and CHICAGO, ILL. Write for Catalogue and Prices.

Our Library Corner.

(*Continued from Page* 283.)

Bul. No. 19, November, 1891, your weeds and your neighbors.

WYOMING—Exp. Sta. at Laramie, annual report, 1891.

FROM THE TRADE.

EDWIN ALLEN & SON, New Brunswick, N. J.: Price list of fruit trees, small fruit plants, ornamental trees and shrubs; Japan snowball and red flowering dogwood, specialties.

AULTMAN, MILLER & CO., Akron, O.: Illustrated catalogue of the Buckeye harvesting machines, giving many artistic illustrations and accurate descriptions of these peerless implements.

P. J. BERCKMANS, Augusta, Ga.: Illustrated and descriptive catalogue of greenhouse and bedding plants. Plants adapted to the Southern and Middle States a specialty.

BUSH & SON & MEISSNER, Bushberg, Mo.: Price list of American grapevines. This list is one of the most complete in the country, being so arranged that the season, size and color of each variety can be ascertained at a glance.

J. S. COLLINS & SON, Moorestown, N. J.: Illustrated and descriptive catalogue of small fruits, grapevines, fruit and nut trees, etc.

M. CRAWFORD, Cuyahoga Falls, O.: Descriptive catalogue of strawberries, especially the most valuable newer varieties.

T. J. DWYER, Cornwall, N. Y.: Descriptive catalogue of small fruits, grapevines, fruit trees, ornamental trees, shrubs, roses, etc. The new E. P. Roe strawberry a specialty.

D. M. FERRY & CO., Detroit, Mich.: Descriptive and richly illustrated catalogue of vegetable and flower seeds; also flowering bulbs, garden implements, etc. A large number of highly promising novelties are offered. A handsome colored plate illustrating six vegetables worthy of a place in every garden.

CHARLES GAMMERDINGER, Columbus, O.: Illustrated and descriptive catalogue of pure-bred poultry, comprising all the leading breeds.

JOSEPH HARRIS CO., Moreton Farm, N. Y.: Harris' Rural Annual. Descriptive and illustrated catalogue of vegetable, flower, grass and clover seeds; also small fruit plants, roses, etc. The cultural instructions and the hints for the use of commercial fertilizers give special value to this catalogue.

PETER HENDERSON & CO., New York City: Henderson's Farm Manual. A descriptive and illustrated catalogue of grasses, clovers and other forage crops. Also field corn, wheat, oats, potatoes and other field crops. Also the culture of water lilies and aquatics. A treatise on the culture of aquatic plants, reprinted from the latest edition of "Gardening for Pleasure." A price list of the best aquatic plants is added.

HENRY C. JEWETT & CO., Jewettville, N. Y.: A handsome pamphlet of over 200 pages, giving pedigrees and illustrations of their famous standard bred trotting horses.

KINGMAN & CO., Peoria, Ill.: A richly-illustrated and descriptive catalogue of machinery, twine and vehicles.

T. F. MILLER, Mattituck, L. I., N. Y.: Descriptive circular and price list of America's three great breeds of poultry — Golden Wyandottes, White Wyandottes and White Plymouth Rocks, bred from the best and purest strains.

T. E. MOORE, Shawhan, Ky.: Descriptive catalogue of the Cedars trotting stock.

MORGAN HORSE CO., Dundee, Ill.: Catalogue of the Morgan horses, comprising some of the most valuable animals of this breed.

WILLIAM PARRY, Parry, N. J.: Catalogue of the Pomona Nursery, giving condensed descriptions and price list of a large collection, comprising small fruits, fruit and ornamental trees, hardy vines, flowering plants, etc.

PITCHER & MANDA, Short Hills, N. J.: A descriptive and beautifully-illustrated catalogue of new and rare seeds, plants, bulbs, etc., etc. This is an elegant pamphlet of 200 pages, apparently gotten up regardless of expense.

POPE MFG. CO., Boston, Mass.: Descriptive circular of the famous Volunteer Columbia bicycles. This company offers $10,000 worth of bicycles as prizes for writing the best essays on the subject of good roads.

ROBERT C. REEVES & CO., New York City: Descriptive and illustrated catalogue of agricultural and horticultural implements and machinery; also garden, field and flower seeds, fertilizers, etc.

E. W. REID, Bridgeport, O.: Illustrated and descriptive catalogue of small fruits, grapevines, fruit trees, ornamental trees and shrubs, hardy perennials, roses, etc. Colored plates of the Eaton and White Diamond grapes; also price list of vegetable and flower seeds.

THE DINGEE & CONARD CO., West Grove, Pa.: Illustrated and descriptive catalogue of all the best new and old varieties of roses, together with valuable cultural directions; also chrysanthemums, and other flowering plants and shrubs, small fruit plants, grapevines, flowering bulbs, flower seeds, etc., etc.

JAMES VICK'S SONS, Rochester, N. Y.: Floral Guide. As usual, this elaborate and handsome guide is full of information and interest to every

(*Continued to Page* 286.)

Short time only I will send my Electric Belts and Trusses

DR. JUDD'S On 6 Months' Trial

If You Wish Health, Address DR. C. B. JUDD, Detroit, Mich.

WILL CURE RHEUMATISM INSOMNIA CONSTIPATION LAME BACK HEADACHE LIVER COMPLAINT KIDNEY COMPLAINT NERVOUSNESS DYSPEPSIA DEBILITY

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ON 6 MONTHS TRIAL. My Electric Belts are the lightest, simplest, most durable, and generate five times more Electricity than any other. Superior to any Box Battery made. A Battery and Belt combined, and produces sufficient Electricity to produce a shock, and should be used by male and female, old and young. As much of a household necessity as sugar, tea and coffee. Not only a cure of disease but also a preventive.

BUTTE CITY, MONT., Jan. 16, 1892.—Within the last eighteen months we have taken in over $1,000 for Judd's Electric Belts and Trusses, and have never had a single complaint, but have had many compliments passed upon them. Reference, Banks and Mercantile Agencies. D. M. NEWBRO DRUG CO.

PILES CURED FREE, New, Painless. Certain. Gives instant relief and lasting cure—never returns. To prove it we will send a trial package FREE, to any address. PYRAMID DRUG COMPANY, Box 35, ALBION, MICHIGAN.

(PATENT ALLOWED.)

Pat. July 28, 1891.

RUPTURE CURED.

Worn Night and Day. Perfect Comfort. Holds the worst rupture with ease. Has a new Pad which can be made larger or smaller by the patient. Sent by mail everywhere. Illustrated catalogue and rules for self-measurement sent securely sealed. G. V. House Mfg. Co., 744 Broadway, N. Y. City.

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Takes hold in this order:

Bowels,
Liver,
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Inside Skin,
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Driving everything before it that ought to be out.

You know whether you need it or not.

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DONALD KENNEDY,
ROXBURY, MASS.

$100 REWARD

For a case of PILES! we can't cure, Address VEGETABLE PHARMACY CO., Lock Box 237, Marshall, Mich.

WHICH ONE SHALL WE SEND YOU

EACH CATALOGUE IS COMPLETE IN ITSELF.

Accordions, Auto Harps, Auto Harp Music, Banjos, Banjo Music, Violins, Violin Music, Violin Bows, Violin Cases, Guitars, Guitar Music, Clarinets, Clarinet Music, Cornets, Cornet Music, Flutes, Flute Music, Violin Repairing, Harmonicas,

C. W. STORY, 26 and 28 Central St., Boston, Mass.

DROPSY TREATED FREE! Positively CURED with Vegetable Remedies. Have cured many thousand cases called hopeless. From first dose symptoms rapidly disappear, and in ten days at least two-thirds of all symptoms are removed. BOOK of testimonials of miraculous cures sent FREE. 10 DAYS TREATMENT FREE by mail. DR. H. H. GREEN & SONS, Specialists, ATLANTA, GA.

$3 Voltaic Electric Belt cures the *weak, nervous, pains, kidney* diseases. Dr. G. W. Dively, Cincinnati, O.

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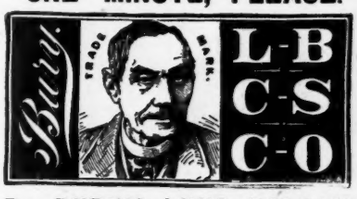

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A Sure Cure for all kinds of Piles, Burns, Salt Rheum, and all Skin Diseases, Colds, Sprains, Chilblains, Quinsy, Sore Throat, Chapped Hands, Ague in the Face, Broken Breast, Earache, Neuralgia, &c.

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These remedies at Druggists or by mail,
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$5 to $15 per day, at home, selling LIGHTNING PLATER and plating jewelry, watches tableware, &c. Plates the finest of jewelry good as new, on all kinds of metal with gold, silver or nickel. No experience. No capital. Every house has goods needing plating. Wholesale to agents $5. Write for circulars. H. E. DELNO & Co., Columbus, O.

FOUND in Galveston, T., an old coin worth.

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MEN, WOMEN, BOYS and GIRLS Wanted. New beginners make from 50c to $1 an hour at home. Send your address for samples and full particulars to Grand Central Novelty Co., Buffalo, N. Y.

CUBAN CIGARS. 3-inch, $10 thousand; 4-inch, $11; 5-inch Perfecto, $15. Sample box by mail, 35 cents. Agts. wanted. J. AGUERO, 50 Fulton street, N. Y.

Our Library Corner.

(*Continued from Page* 285.)

lover of fruits, flowers and vegetables. The frontispiece consists of a brilliantly colored plate of new Cannas. The American Wonder potato, the Golden Nugget corn, Charmer pea, and Danvers Yellow onion are similarly illustrated. The general list is selected and very complete.

F. WALKER & Co., Louisville, Ky.: Descriptive catalogues of flowering plants and shrubs, small fruit plants, grapevines, evergreens, ornamental shrubs, etc.

WOOD BROS., Union Stock Yards, Chicago, Ill.: Facts and figures of the Chicago live stock trade, giving valuable statistics in regard to the live stock trade and collateral branches not easily obtained elsewhere.

FRANK H. VICK CO., Rochester, N. Y.: Illustrated and descriptive catalogue of ornamental trees, hardy shrubs, roses, small fruits and decorative plants; also plain and practical instructions for planting, care of plants, and the number of plants required for an acre, which gives additional value to this pamphlet.

J. C. VAUGHAN, Chicago, Ill.: A very large, handsome, illustrated descriptive price list of vegetables, bulbs, plants, small fruits, seeds, implements, etc. The colored plate of the pearl collection of new roses is especially noteworthy.

SAMUEL WILSON, Mechanicsville, Pa.: Illustrated and descriptive catalogue of garden, field and flower seeds. Several colored plates, illustrating the Lutie grape, the Japanese wineberry and other new fruits.

WEBB & SONS, Wordsley, Stourbridge, England: This is a real gem in the catalogue literature of the season. It is a large quarto volume with a stiff cover and one-half dozen colored plates, each one of which is a real work of art. In this respect our American catalogue makers can still learn something from their English cousins.

SNYDER & GAYLORD, Atchinson, Kan.: Circular and price list of the new bronze sweet potato.

VILMORIN-ANDRIEUX, Paris, France: Catalogue of seeds, strawberries and flowering bulbs. This pamphlet of nearly two hundred pages, closely printed, appears to contain the names of about every variety in existence.

STARK BROS. NURSERY, Louisiana, Mo.: Catalogue and price list of fruit trees, small fruits, grape vines, root grafts, cions, bulbs, etc. Illustrations of the Star green gage, Japan winter pear, Idaho pear and other special novelties.

GREEN'S NURSERY CO., Rochester, N. Y.: "How We Made the Old Farm Pay," is the title of the annual catalogue of this famous firm. The descriptive and illustrated lists of fruit trees, small fruit plants, grapevines, ornamental trees, shrubs, etc., are very large and carefully selected. How the proprietor transformed the old, run-down farm into the extensive Green's Nursery of the present day is pleasingly told in the introductory chapter.

BRADLEY FERTILIZER CO., Boston, Mass.: Cigar wrapper tobacco—how to grow, cure and market it. An interesting pamphlet, giving valuable information on the cultivation, fertilization and general management of tobacco, with special reference to the value of Bradley's high grade tobacco manures.

ALFRED BRIDGEMAN, New York City: Descriptive and illustrated catalogue of vegetable, grass and flower seeds, garden tools, small fruit plants, ornamental shrubs, trees, etc.

T. F. MILLER, Mattituck, L. I., N. Y.: Circular and price list of pure bred Golden and White Wyandottes and White Plymouth Rocks.

The Outlook for Prices of wheat has been slightly changed since writing our review of the situation on Page 272, by the appearance of the official statement of exports for February. It seems that only 8,826,155 bushels were exported as wheat and 1,413,752 barrels of flour, a total of 15,198,000 bushels as wheat, against a monthly export of from 20,000,000 to 25,000,000 bushels since August last. The official statement makes the total export of wheat, and flour as wheat, in the eight months to February 29, as 159,128,666 bushels, or 5,000,000 bushels less than the Department of Agriculture assumption. To make up for this falling off in the wheat movement, our corn exports in February were 12,728,990 bushels, nearly ten times as much as in February last year, while for the eight months ended March 1, corn exports were 45,000,000 against 21,000,000, exclusive of corn meal, of which only the usual amount has gone abroad. February shipments of oats in the grain were light, but extraordinarily heavy in the meal, and, including both as grain, oat exports from July to March are 7,747,300 bushels against 1,212,164 bushels in the same time last year. Nearly 800,000 bushels of rye were exported in February, making a total for the eight months of 9,496,000 against only 323,000 bushels.

A Corn Contest of a novel kind is being conducted by *Farm and Home* of Chicago, Ill. It offers to divide $100 in prizes among those of its subscribers who contribute the best article on harvesting, handling and feeding the corn crop from the time it is ready to harvest until the crop is sold or otherwise converted into cash. Every person interested in this crop will find it will pay him to subscribe for that enterprising semi-monthly, price 50 cents a year, and enter the contest.

RELIEF IS FOUND

and permanent **Cures** are effected by the **Owen Electric Belt and Appliances** when all other remedies fail. **They act as a natural stimulant and tonic to the whole system WITHOUT ANY BAD EFFECTS.**

Men, Women and Children use them with equally beneficial results.

A DOCTOR

Suffers, and Swears Under Oath What Cured Him.

HOLYOKE, MASS., Jan. 25, 1892.

GRIFFIN RENO, M. D., Supt. The Owen Electric Belt and Appliance Co., New York.

DEAR SIR: In accordance to the promise I made you, please find inclosed testimonial. I have been a sufferer from muscular rheumatism in shoulders and back for fifteen years. At times I could not bend my body without causing intense pain in my back. There was not a place on my body, from the shoulders down to the sciatic nerves in my hips, that you could touch without causing pain. My flesh seemed to be very sore, could not sleep on my left side on account of lameness of my left shoulder. It did seem at some times that I would lose my reason. I tried all known remedies for muscular rheumatism. I used an electric battery every day for two years with only temporary relief. I also wore a Wilsonian Magnetic Vest, from which I received no benefit, besides it was very uncomfortable. I received a circular May last in regard to Dr. Owen's Electric Belt. I bought a number 3 Belt last June, and have had no pain since I first put it on. I find it a very comfortable belt, nothing bungling about it. I recommended it to a friend of mine, who bought one, and is well pleased. If I could not replace it I would not take any amount of money for my belt. I would not give my belt for all the doctors in Massachusetts if I could not get another. I would say to those who are suffering from this disease to try one of Dr. Owen's Electric Belts, and you will find relief at once, for it did for me what medicine could not do, and trust it will do the same for you.

Dear Doctor, I feel it my duty to inform the people of your wonderful discovery.

Yours respectfully,
DR. G. G. REED, P. D.,
283 High street, Holyoke, Mass.

Dr. G. G. Reed has personally appeared before me and taken oath that the foregoing statement is true.

JOHN HILDRETH,
Justice of the Peace.

January 25, 1892. Holyoke, county of Hampden, Mass.

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Is generated in a battery on the belt and can be applied to any part of the body. The current can be made mild or strong as the case may require, and is absolutely under control of the wearer al all times.

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Contains fullest information regarding the cure of Acute, Chronic and Nervous Diseases, Sworn Testimonials with portraits of people who have been cured. Price List and Cuts of Belts and Appliances, and how to order, published in English, German, Swedish and Norwegian Languages. This Catalogue, or a Treatise on Rupture Cured with Electric Truss, will be mailed to any address on receipt of six cents postage.

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WHOSE ANSWERING AN ADVERTISEMENT WILL CONFER A FAVOR UPON THE ADVERTISER AND THE PUBLISHERS BY STATING THAT THEY SAW THE ADVERTISEMENT IN THE AMERICAN AGRICULTURIST.

HENCH & DROMGOLD'S
ALL-STEEL FRAME SPRING-TOOTH HARROW

A Wonderful Improvement.

Teeth Quickly Adjusted by only loosening one nut.

THE BEST Tooth Holder ever invented.

The tooth is held in position by a Ratchet with which it can be adjusted so as to wear from 15 to 18 inches off the point of the tooth, which is four or five times as much wear or service as can be obtained from any other Spring-tooth Harrow in existence. Catalogues free. *Agents Wanted.*

Over 10,000 of these Harrows sold in 1891.

Be not deceived, buy only the

HENCH & DROMGOLD HARROW.

☞ Ask your dealer for it.

We also manufacture **CIRCULAR SAW MILLS, HAY RAKES, CULTIVATORS, CORN PLANTERS, SHELLERS, &c.**

HENCH & DROMGOLD, YORK, PA.

Yankee Swivel Plow.

The Leading Wood Beam Reversible Plow of America.

Sizes for One, Two or Three Horses.

Patent Spring Foot Latch, Automatic Jointer, Straight Steel Coulter, or Rolling Caster Coulters, and all late improvements.

Belcher & Taylor Agricultural Tool Co.,

Box 120. **CHICOPEE FALLS, MASS.**

Best Utensil in the universe

TAKE AN AGENCY for DAGGETT'S SELF-BASTING ROASTING PAN

Needed in every family. **SAVES 20 Per Cent.** in *Roasting* and *Bakes the Best Bread* in the world.

Address nearest office for terms.

W. A. DAGGETT & CO., Vineland, N. J. Chicago, Illinois. Salt Lake City, Utah. East Portland, Oreg. Oakland, Cal.

SELF THREADING SEWING NEEDLES. Weak sighted or blind can thread them. Finest silver spring steel. One style threads on end other on side. Sample paper by mail 10 cts., 2 for 15c., 5 for 25c., 12 for 60c. either kind or assorted papers. Money easily made in selling them. Address CHAS. E. MARSHALL, Lockport, N. Y.

EARLIEST OF THE EARLY! THE LEADER STRAWBERRY.

Signally the novelty of the year. Received 3 prizes from the Massachusetts Horticultural Society, 1891. Send to Headquarters for Circular and Price List.

C. S. PRATT, Reading, Mass.

SEEDS. 12 pkts. *Flower* **10c.** 12 pkts. *Vegetable* **30c.** 6 Dahlias **50c.** 10 Gladiolus **30c.** All **$1.** Half **50c.** **H. F. BURT,** Taunton, Mass.

$20 PHOSPATE FOR CORN and POTATOES.

☞ Sold to farmers direct. No agents. **York Chemical Works, York, Pa.**

WALL PAPER SELECTED BY MAIL Large variety, latest styles at factory prices. Send **8 cents** postage for a full line of samples. **THOS. J. MYERS,** 1210 Market St., Phila., Pa.

FARMERS Saw and Grist Mill. 4 H.P. and larger. Catalogue free. **DeLOACH MILL CO., Atlanta, Ga.**

New Cards Largest Sample Book of genuine hidden name, silk fringe, envelope, acquaintance & calling cards ever offered for a 2c. stamp. Buckeye Card Co., Laceyville, Ohio. **1892**

WANTED—Lady or gent in each place can make $3 a day sending out circulars on our new plan. Send stamp for sample and terms to **ART NOVELTY CO.,** Louisville, Ky.

HOLLINGER Fence and Post Will Last a Lifetime. Joint Stay Iron Post Smooth Wire. Best in use. Prices 20c. to 45c. per rod. Ohio and east address, **I. K. HOLLINGER,** Covington, O. West of Ohio, **D. HOLLINGER,** Mt. Morris, Ill.

The Problem of Cotton.

So unprecedented was the cotton movement in February that the official returns indicated 7,914,531 bales as having been moved between September 1, 1891, and March 1, 1892, an increase of nearly half a million bales over the corresponding six months of the previous crop year. During the first half of March, too, the movement is over one-third larger than in that month a year ago, and lends force to the now current belief that the movement to August 31st will exceed 9,000,000, or fully 10 per cent. more than seemed possible from the January returns to the United States Department of Agriculture, issued February 12th, and considered in the AMERICAN AGRICULTURIST for March. This, however, adds only 500,000 bales to the final excess in the world's supply pointed out in our March number.

This continued great movement emphasizes the enormous proportions of the crop grown in 1890. Although its movement, to September 1, 1891, was less than 8,700,000 bales, the back country was "full of old cotton" before the '91 harvest began. It is this surplus of the '90 growth that has evidently swamped all calculations, for last year's crop was certainly much less than the year before, and the October movement confirms this view. It will never be known just how much cotton was produced in the United States in 1890, but the AMERICAN AGRICULTURIST believes it was nearer 10,000,000 bales than the 8,655,518 bales reported.

The census of 1889, just announced for three States, bears out this conclusion. The Alabama census agrees quite closely with the United States Department of Agriculture reports, but in Louisiana the census crop is 38 per cent. more than Department returns indicate, and in Mississippi is one-fourth greater. Taking the official census for 1889 as a basis, and applying to it the Department reports of State averages of acreage and yield for the years 1889-'90-'91, we find that the yield in the three States named is 27 per cent. more than could be estimated from Department returns carried along from the Department's data of the 1888 crop.

The acreage has also been greatly underestimated, as suspected. The above method of calculation shows here, as with yield, quite close agreement between the census and the Department in Alabama, but a wide departure in Mississippi and Louisiana, aggregating **eight** per cent. in the three States when averaged for three years. The details of these calculations thus appear, in brief:

Alabama.	1889.	1890.	1891.
Acres, census	2,761,771	2,755,806	2,810,922
" Department	2,794,708	2,902,960	2,786,842
" discrepancy	+32,937	+147,154	—24,080
" " per cent.	+1.2	+5.4	—0.9
Yield, census (bales)	915,414	953,509	950,092
" Department "	911,075	987,006	869,495
" discrepancy	4,439	33,497	80,597
" " per cent.	—0.5	+3.5	—8.5
Mississippi.	1889.	1890.	1891.
Acres, census	2,882,499	2,940,148	2,998,952
" Department	2,643,841	2,649,128	2,516,672
" discrepancy	238,658	291,020	482,280
" " per cent.	8.3	9.9	16.0
Yield, census (bales)	1,154,406	1,231,341	1,181,601
" Department "	872,467	906,002	825,468
" discrepancy	281,939	325,338	356,133
" " per cent.	25	27	21
Louisiana.	1889.	1890	1891.
Acres, census	1,270,885	1,207,340	1,159,046
" Dept. of Ag.	1,120,836	1,036,862	995,388
" discrepancy	150,049	170,478	163,658
" " per cent.	12	14	14
Yield, census, bales	659,583	556,426	565,614
" Department "	403.519	354,607	338,432
" discrepancy "	256,064	201,819	227,182
" " per cent.	38	40	40

The export movement continues fully as great as last year, the official statement of February exports showing 302,217,384 pounds against 299,619,675 pounds last year. The total export for six months ended February 29, is this year 4,416,741 bales against 4,413,674 bales last year. The value of the six months' export is $196,343,000, or $25,000,000 less than for the like period last year, which further emphasizes the substantial fall in value.

Information for Blacksmiths.—The AMERICAN AGRICULTURIST never fails to bring interesting and valuable reading matter. My trade is that of a blacksmith, and I own only a small farm, yet I find in your periodical a good deal of valuable information for a blacksmith.

W. A. EDDY, Adams Co., Wis.

The Best by All Odds.—I think the AMERICAN AGRICULTURIST is, by all odds, the best farm paper published. W. SMITH, Knox Co., Ohio.

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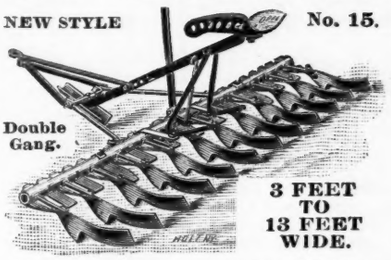

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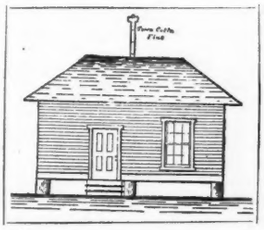

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Chemicals and Clover.

This is the title of a pamphlet of 34 pages written by Mr. H. W. Collingwood, managing editor of the *Rural New Yorker*. In a clear, concise manner, it gives a record of successful farm operations where a high grade complete manure and sod supply a cheaper manure than that obtained from keeping live stock. There are thousands of farmers, as well as city residents, who own large country seats and farms, who have found it a losing business to try to bring up their land to fertility by buying animal manures. For these, especially, the perusal of this pamphlet will open new and bright vistas through which they can see a way to improve their farms, not only without loss, but with actual profit. The value of the system of rotation, and the enriching of the soil, here described in detail and as actually carried out by intelligent farmers, is so plainly demonstrated that no reader of it can be left in doubt as to its great importance. One great advantage of this system, as practiced on the Lewis Farm in New Jersey, is that all the farm manure is used on the corn instead of on wheat or other crops. The hot summer after June is particularly favorable for the action of the chemical processes of the soil, including nitrification and in converting farm manure and all coarse materials in the soil into available plant-food. Corn, during its long summer growth, can freely use these manurial supplies. Not so with wheat, for its growth stops soon after the corn crop has fairly started growing. When 1,500 pounds of fertilizers are used on an acre of potatoes, with wheat and grass to follow, it means only *annual* applications of less than 500 pounds. It is *concentration* everywhere. The potatoes pay for it all. While the sales of hay from this farm are heavy, this item is almost clear gain, because the potatoes have paid for all the fertilizer needed for three or four years. Not only that, but they paid for it in the same year it was bought. This fact cannot be too often repeated—it is the key-note of the success with fertilizers. If, instead of using 1,500 pounds on the potatoes, these farmers should use 500 on potatoes, 500 on wheat, and 500 on grass, their bills would be as high as now, the labor three times as great, and the crops of potatoes cut down nearly one-half, with but a small increase in grain and hay. It will thus be seen that the *rotation* is one particularly well suited to the use of chemicals. This system of complete manuring with rotation was devised and developed by Mr. Charles V. Mapes.

It is because potatoes *are* the money crop of the farm, that they are petted and pampered and fed on the choicest food. The corn plant is the key-keeper of the rotation. Clover supplies the crude material, and corn "manufactures it into suitable humus" for the potato plant, yielding its grain as almost clear gain. On a rotation of this sort, where first-class potatoes are to be grown, the corn crop is almost as important as the clover because of its ability as a weed-cleaner, and its skill as a manufacturer of potato humus or suitable vegetable matter to go with the chemicals to make the best "artificial dung."

Mr. Lewis, after fifteen years of experience with the system, is fond of saying: "I will take any farm in the country that is reasonably level and has anything in the way of 'foundation,' no matter how poor it may be, and double its producing capacity at a profit."

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The Farmer in Congress.

The Paddock pure food bill passed the Senate March 9, in a form that simplifies its enforcement without materially lessening its efficacy. The measure will be as bitterly contested in the House as it was in the upper branch by those who fear its power to compel all compound foods intended for interstate commerce to be branded as such.

The crusade against the so-called anti-option bill is waxing hot. The boards of trade throughout the country, and the great banking interests are allied against it. The masses, however, are rallying to its support with magnificent enthusiasm, as is shown by the flood of letters and petitions daily received by Congress demanding legislation that shall put a stop to the curse of bucket-shop gambling. The chances are that when the bill is reported by the House Committee on Agriculture it will be shorn of any unwise restrictions, on legitimate trade in owner's contracts for future delivery, but will be sufficient to reach the bucket-shop evil. This is the very principle we are all contending for. Let us hope it will not be sacrificed in the effort to placate the opposition. Some legislation on this subject is almost sure to be enacted but the AMERICAN AGRICULTURIST desires a law of practical utility, or none at all. Don't give us a stone when we ask bread.

The Fathers of the Anti-Option Bill.

Mr. Washburn has come into special prominence by his efforts in behalf of the so-called Washburn-Hatch anti-option bill. He was a Maine farmer boy, graduating from Bowdoin college in 1854, and going West three years later after studying law. He soon became indentified with the varied interests of Minnesota, especially of Minneapolis. He was the projector, and for a time president, of

two important railways—the Minneapolis and St. Louis and the Sault Ste Marie line. He is best known for his large interests in the Minneapolis water power, and more especially for his management of the great Washburn flour mills, now largely owned by an English syndicate. He was a member of the 46th, 47th and 48th Congresses, and entered the United States Senate as republican in 1889.

William H. Hatch of Missouri, chairman of the House Committee on Agriculture, is doing yeoman service for this and other measures affecting our agricultural interests and is too well known to our readers to require further notice. His portrait and an account of his life appeared in the AMERICAN AGRICULTURIST for April 1889. He is a farmer, lawyer and democrat.

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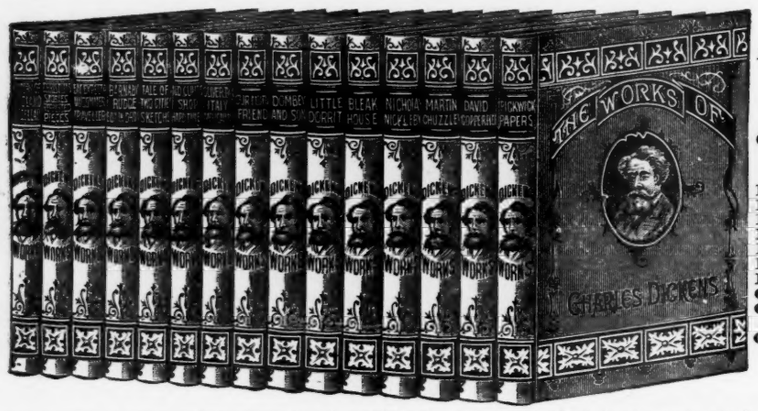

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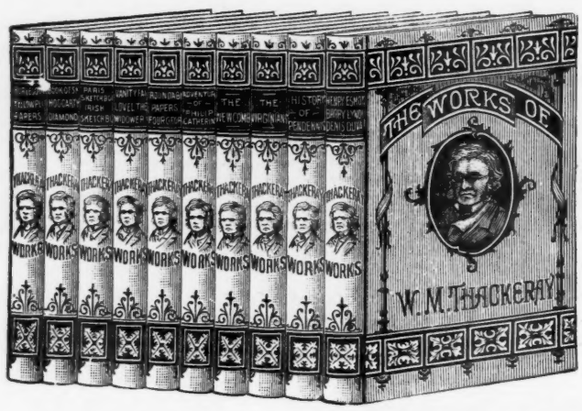

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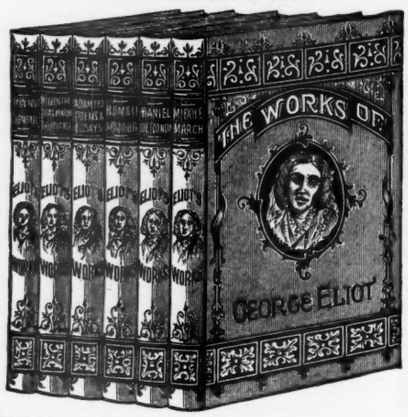

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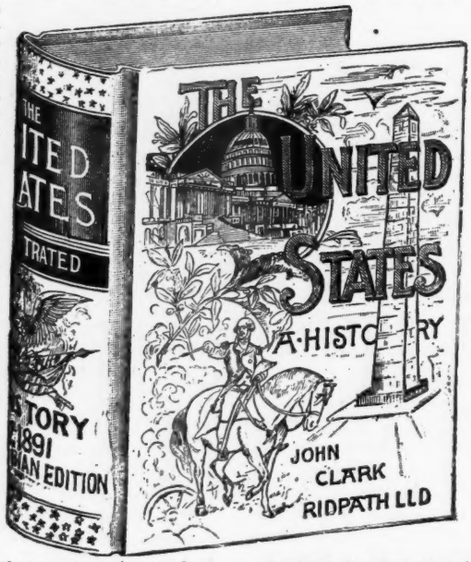

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APRIL, 1892.

The Unexpected in Sugar.

No apology is needed for the liberal space devoted of late by this magazine to the beet-sugar industry. The improved processes of manufacture are no longer an experiment. The growing of beets at a profit for the prices sugar factories have paid is a demonstrated success. The main necessity, at present, is to educate both the farmer and the capitalist up to the possibilities of the industry as now insured by Government bounty, so that an abundance of beets may be produced for existing factories, and also for many new ones. A general view of the industry, by Dr. Wiley, chemist to the United States Department of Agriculture, was a feature of our Anniversary Number, in January; in our March number its possibilities were ably set forth by a competent authority—lately private secretary to Mr. Claus Spreckels, the well known sugar king. The same writer contributes a still more striking article to the current issue, on beet sugar as an investment.

The first of unexpected developments likely to mark the brilliant future of beet-sugar production in the United States, is the extent to which sugar factories are about to be established and managed coöperatively. No field for coöperation is more promising. Since so much depends upon securing a bountiful supply of beets of the right kind, in no industry is coöperation between the farmer and the capitalist more necessary. While five dollars per ton can easily be paid by any factory for an assured supply, it would be far better if the beet growers would unite with capitalists in furnishing the money required for a beet-sugar manufacturing plant. This might be done with the understanding that, after paying 10 per cent. interest on the capital stock and five dollars per ton for the beets, the rest of the profits should be divided equally between capital and beets.

Take the case of the average factory, with $300,000 capital, working up 15,000 tons of beets to get 1,500 tons of marketable sugar. If this sugar sells for only enough to pay for the beets and to meet the operating and maintenance expenses of the plant, the bounty, after using $30,000 of it to pay the guaranteed interest on capital, would leave enough to warrant a dividend of one dollar per ton on beets ($15,000) and five per cent. on capital. This would make a total of six dollars per ton for beets (or sixty to one hundred dollars per acre gross) and 15 per cent. absolutely net for capital. These are inside estimates; realities ought to be much better, provided plenty of beets are grown to keep the factories running as long as the sugar content can be kept from deteriorating.

The chief obstacles in the way of such coöperation, aside from the difficulties that usually attend the farmers' efforts to get together, are two: First, the tendency to over-capitalize the factory by loading it down with bonuses, thus creating a fictitious amount on which dividends must be paid; and, second, the danger that farmers will not produce sufficient beets until the second or third year of the enterprise. By having both capitalist and beet grower equally concerned, self-interest would reduce these obstacles to the minimum.

Another and probably an unexpected effect of the beet sugar will be a diminution in the business of the large refineries now located at New York, Brooklyn, Boston, Philadelphia, Baltimore, New Orleans and San Francisco. It cannot be expected that the consumption of sugar will keep pace proportionately with the increase in the beet-sugar product. This latter is now manufactured ready for market in such condition as to make it almost equal to refined granulated sugar, and it can be marketed as such in the immediate vicinity of the beet factories, without being refined. For every 100,000 tons of beet sugar that we produce, it is safe to reckon that the output of imported sugar by existing refineries will be reduced by 90,000 tons, allowing ten per cent. for increased consumption. This has an important and direct bearing upon one branch of our leading manufacturing industries. It has, moreover, such a direct bearing as to preclude all and every possibility of the sugar market being controlled, directly or indirectly, by any trust, combine or agreement on the part of refiners, for it would hardly be possible for them to purchase or control all the different and independent beet-sugar factories that will be in active operation throughout the country.

Unknowingly, and unthinkingly, Congress has provided the death-blow to sugar trusts and to the exercise of monopoly. Existing refiners will lose a very considerable percentage of their present business, especially in the supply of interior and Western markets where beet sugar will be most largely produced. They will also lose control of prices, at least, for some months in the year, and they will further be compelled either to reduce the output of all active refineries, or to curtail their operations by closing some of them. It will be a case of the survival of the fittest, and in this case the beet-sugar industry is the fittest, because it provides a home market for a profitable crop in sections that most need to diversify their farming.

Reduce the Cotton Area.

The acreage of cotton has been underestimated nearly 10 per cent., and the yield has been underestimated upwards of 25 per cent. A comparison of census statistics with the Department of Agriculture returns, elsewhere made, appears to justify this conclusion.

It demonstrates conclusively the imperative necessity of limiting the cotton area beyond the utmost yet attempted. It more than confirms every argument that has been made as to the necessity of such reduction. The South must grow a smaller area of cotton or with a favorable season the new crop may not command more than four cents per pound throughout a large section of the South. This would cause absolute ruin, at least temporarily, for a great majority of Southern farmers.

This staple can be grown at less cost per pound than has been the case in former years. Good husbandry must be practiced to do this. Such methods are more important this year than ever. We agree with all that is being said about the necessity of better cotton farming, as well as more diversified agriculture in the South, yet we emphasize again the imperative importance at this time of every planter putting in only two acres where last year he put in three.

The World's Fair and Chicago.

Speaking for the great mass of farmers throughout the United States, the AMERICAN AGRICULTURIST wishes to wholly discountenance the unpatriotic spirit displayed by certain members of the New York city press in their treatment of the great Columbian Exposition. This affair is planned to be the most stupendous exhibit of the world's progress in the history of mankind—a fitting celebration of America's four hundred years, and in every way worthy of the greatest nation in all time. To carry out this ideal will require a loan of several million dollars from the Federal Government, the return of which must depend upon the financial success of the enterprise as a business venture.

Congress should grant the money. Not because Chicago asks it, not because there is every probability that it will be repaid, but because the patriotic spirit of our people demand it. The wonderful city of Chicago—the great heart of a vast continent—will doubtless profit in no mean way from the fair in its midst. But the benefit to the whole United States will far outweigh any selfish consideration on this score. There is no justice in asking that magnificent municipality to bear the entire risk of an undertaking which it has shaped and developed with characteristic American enterprise. As well ask New York city to pay for and maintain the Erie canal which benefits so enormously the commerce of this port. The petty jealousy shown by some citizens and journals of Manhattan Island libels the cosmopolitan character and patriotic impulses of the people of New York city and State.

The Columbian Exposition will have its greatest result in idealizing our national life. Stupendous will be its revelation of our material progress. But even more inspiring will be the lesson that our individual and collective existence is not merely competition between men and communities for physical gain, but a mental and moral life that best expresses itself in a national spirit which recognizes no North, no South, no East, no West, but finds its purest expression in the blessed Stars and Stripes, in the lovely home circle, and in confidence-inspiring trust in the God of Nations.

Only in this sense will the Exposition be the fullest success. The cash receipts will doubtless meet the expenses of the fair, but few exhibitors will receive direct benefits at all commensurate with what the same time, labor and expense would bring them if invested in the usual methods of pushing trade. The full recognition of this fact at the start is the soundest insurance of a success that will usher in a new epoch for the American nation.

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